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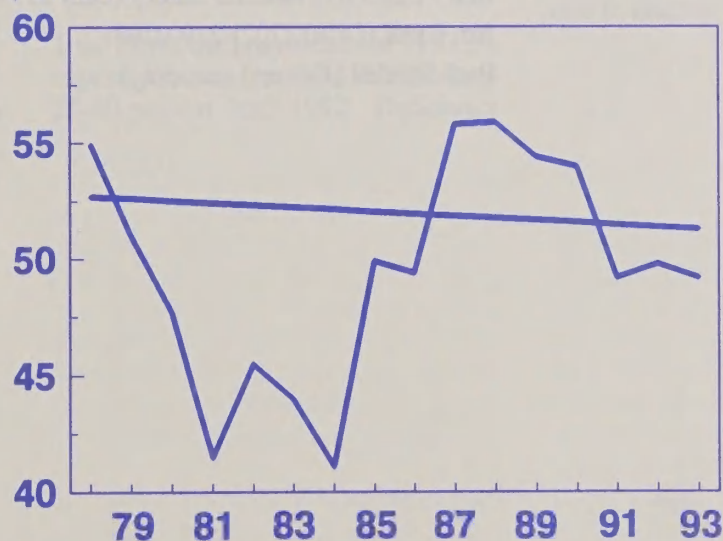
Agricultural Income and Finance

Situation and Outlook Report

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**Recent Real Net Cash Incomes
Near Long-Term Trend**

\$ billion 1987



1992-93 forecast.

Approved by the World Agricultural Outlook Board. Summary released December 14, 1992. The next summary of the *Agricultural Income and Finance Situation and Outlook* is scheduled for release on February 17, 1993. Summaries of Situation and Outlook reports may be accessed electronically through the USDA CID system.

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Contents

Summary	3
Farm Income Outlook	
Record Crop Production Raising Incomes and Inventories	4
Most Farms and Ranches To See Earnings Rise	6
Balance Sheet Outlook	
Outlook is for Gradually Improving Financial Position	8
General Economy	
Economic Growth Improved in the Third Quarter	10
List of Tables	12
Special Articles	
IRS Estimates of the Aggregate Net Farm Profit (Loss) of Farm Sole Proprietors	13
Value-added for the U.S. Agricultural Sector	19
Appendix Tables	27
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Summary

Record Crop Production Raising Incomes and Inventories

Record or near-record yields for many major U.S. field crops (grains, soybeans, and cotton) have raised estimates of 1992 net incomes. For 1993, first indications point to net cash income approaching 1990's record.

Calendar 1992 ends with net cash income of \$60 billion (up 4-5 percent from 1991) and net farm income of \$51 billion (up 13-14 percent). Net farm income, which includes noncash income and expense components, is up more than net cash income due to an additional \$4 billion in inventories that are expected to be carried over into calendar 1993.

Calendar 1993's net cash income is projected at \$58-\$64 billion (up 1-2 percent), very near or equal to 1990's record. This is due to just slightly lower receipts, much higher Government payments, and only slightly higher cash production expenses. Net farm income for 1993 is forecast at \$42-\$48 billion (down 12-13 percent from 1992's record-tying \$51 billion), but could still be higher than in 1991.

Prices for the rest of the 1992/93 marketing year are expected to be down for all major field crops. Lower 1993 crop

prices will likely offset the higher production that will carry over for sale in calendar 1993. First forecasts for 1993, however, are showing receipts down only slightly.

Following 1992's record production, wheat is showing the largest drop in 1993 cash receipts of any crop. Wheat cash receipts are off \$500-\$900 million (7-9 percent) from a year earlier. Receipts for other major field crops are down, but each by less than \$200 million. Cotton producers and greenhouse/nursery operations could see higher receipts in 1993.

Beef production and prices are expected to stabilize over the next few months, which could end the last 2 years' decline in cattle and calf receipts. Hog prices are still forecast near breakeven, but increased production could bring about slightly higher receipts. Higher broiler prices and production through at least the first half of 1993 will likely lead to increased broiler receipts. Egg receipts, after declining the past 2 years, are likely to recover and may exceed 1990.

Total direct cash payments for 1993 are expected to average \$10-\$12 billion, up 25-40 percent from 1992. Deficiency

payments are expected to increase in 1993 because of low prices for program crops following 1992/93's record production, particularly for corn and wheat. This reverses a 6-year decline. Feed grain payments are expected to nearly double next year. Cotton payments also are forecast up.

In 1991 and 1992, production expenses actually fell, mostly from declining feeder livestock and fuel prices. Input expenses are expected to begin rising again next year. While feed prices are still down, and therefore feed expenses are expected to be down, all other major expense accounts are likely to rise in 1993. Production costs for major field crops are forecast up 1 percent from 1992.

Farm business assets, debt, and equity are each expected to rise as much as 1 percent in 1993. While these moderate increases suggest a stabilizing farm economy, they are projected to lag the general rise in prices of 2-3 percent. As a result, real (using the GDP deflator) asset, debt, and equity levels are forecast to decline 1-3 percent.

Record Crop Production Raising Incomes and Inventories

Record or near-record yields for many major U.S. field crops have raised estimates of 1992 net incomes. For 1993, first indications point to lower prices, expenses up only slightly, and net cash income approaching 1990's record.

Current indications point to higher 1992 net incomes than were forecast this past September. Rising yield projections for this year's crops have offset somewhat lower prices, raising forecasts for crop receipts which are now expected to offset reduced livestock receipts. Most improved commodities are wheat, vegetables, and dairy products.

Price indices for major production inputs have fallen in the third and fourth quarters of 1992, and even with increased acreage, expenses have held the line. Current forecasts show cash expenses of \$124 billion, down 1 percent from 1991.

This year ends with net cash income of \$60 billion (up 4-5 percent from 1991) and net farm income of \$51 billion (up 13-14 percent). Net farm income is up more than net cash income due to an additional \$4 billion in inventories that are expected to be carried over into calendar 1993. This leaves 1992 farm earnings just below 1990's record.

Record '92 Production Leading To Lower '93 Prices

USDA's November *Crop Production* report showed the 1992/93 corn crop at its highest ever, wheat yields just one-tenth bushel under the record, soybean production up 9 percent from last year and the highest since 1982, and rice production the second highest on record. Upland cotton output, however, is expected to be down from 1991/92 due to lower acreage. Many acres originally planted to cotton in the Southern High Plains this year were abandoned early in the season due to abnormal wetness and replanted to sorghum. Prices for the rest of the 1992/93 marketing year are expected to be down for all major field crops.

Beef and hog production were also high this past year and will probably con-

tinue rising in 1993. Hog producers are reporting they intend to have 3 percent more sows farrow this winter. Pigs saved per litter continue to set records. This points to higher pork production at least through next summer, which will likely lower prices \$1-\$2 per cwt in 1993.

Analysts expect broiler production to increase next year with prices steady to rising slightly. Turkey production is also expected to increase. Low turkey prices the past 2 years have dampened earnings, but there has been some strengthening this fall. Lower feed costs expected next year will benefit the industry. Milk production is expected to continue increasing slightly into 1993 and prices will likely fall nearly \$1 per cwt.

Receipts Expected Stable to Down Slightly in 1993

The lower 1993 crop prices will likely offset the higher production that will carry over for sale in calendar 1993. First forecasts for next year, however, are showing crop receipts down only slightly. Wheat is showing the largest drop of \$500-\$900 million (7-9 percent). This is coming on the heels of 1992's near-record wheat receipts and could still be the fourth or fifth highest-valued U.S. wheat crop ever. Receipts for the other major field crops are down, but each by less than \$200 million.

Two crop sectors could see higher receipts next year. Cotton growers saw very low prices throughout most of 1992 in response to high 1991/92 world cotton production. With even a slight price increase in 1993, cotton receipts will rise. The \$8-\$9 billion greenhouse and nursery sector has seen steady growth for many years. With an expected strengthening in the general economy, demand for household and landscaping plants should increase.

Livestock analysts are expecting beef production and prices to stabilize over the next few months, which could stop the last 2 years' decline in cattle and calf receipts. The same could happen with hogs. Hog prices are still forecast near breakeven, but higher production could bring about slightly higher receipts.

With broiler prices expected up at least through the first half of 1993, higher production will likely lead to higher receipts. Eggs, with declining receipts the past 2 years, are likely to recover to or exceed 1990's.

Government Payments Could Rise for First Time in 6 Years

Reversing a 6-year decline, low program-crop prices expected from 1992/93's record production will likely raise 1993 deficiency payments, particularly for corn and wheat. Feed grain payments are expected to nearly double next year with wheat and cotton payments also forecast up. Should expected conditions hold, total direct cash payments would average \$10-\$12 billion, up 25-40 percent from 1992.

Expenses Rising 1-2 Percent

In 1991 and in 1992 as currently forecast, production expenses actually fell. Much of the declines came from falling feeder livestock prices responding to higher production and falling fuel prices after the Iraq war. Analysts expect input expenses to begin rising again next year. While feed prices are still down, and therefore feed expenses are expected down, all other major expense accounts are likely to rise.

Net Cash Income in 1993 Could Approach 1990 Level

The result of just slightly lower receipts, much higher Government payments, and only slightly higher cash production

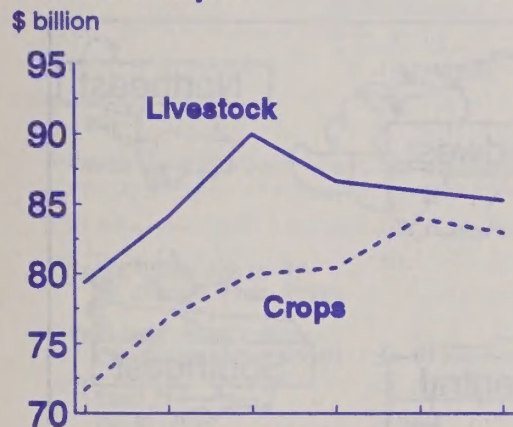
expenses is higher net cash income forecast for 1993. Ranging from \$58-\$64 billion, net cash income could be up 1-2 percent, very near or equal to 1990's record.

For 1993 net farm income, which includes noncash income and expense

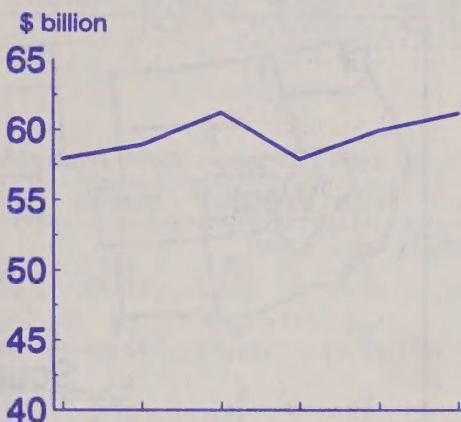
components, the first forecast indicates a range of \$42-\$48 billion. This is down 12-13 percent from 1992's record-tying \$51 billion, but could still be higher than in 1991. Inventories are the major factor this year and next in the expected level of net farm income. The increased estimates of grain production

for 1992 provide more grain than can be sold in 1992. This will likely add \$4 billion to net farm income in 1992 and reduce it by \$2-\$3 billion in 1993 as the excess grain clears the market.

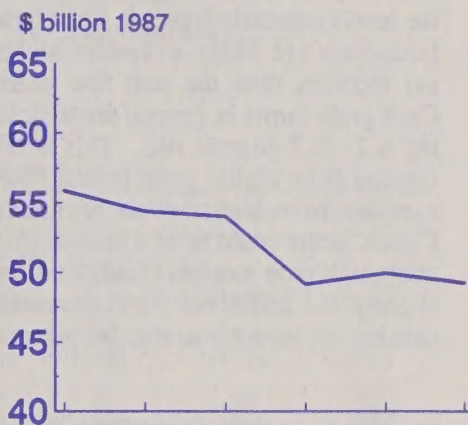
Cash Receipts



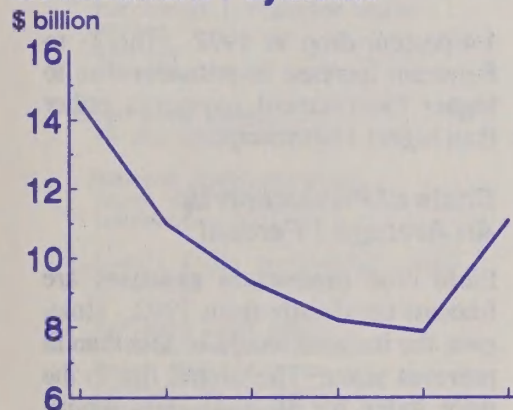
Net Cash Income



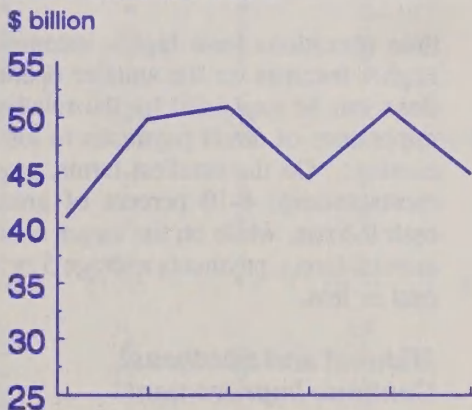
Real Net Cash Income



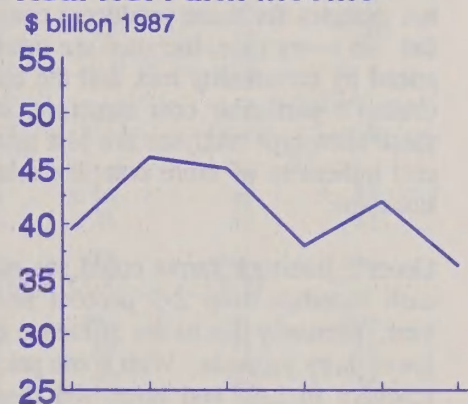
Government Payments



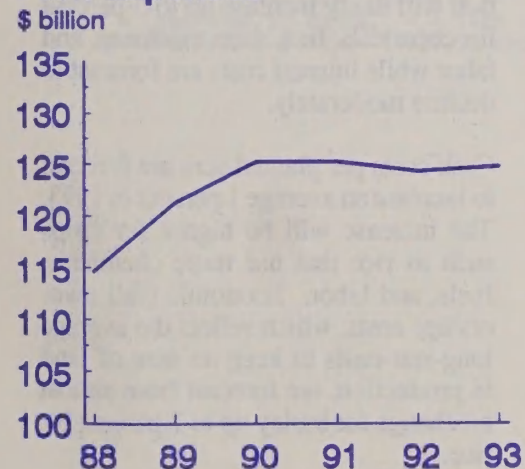
Net Farm Income



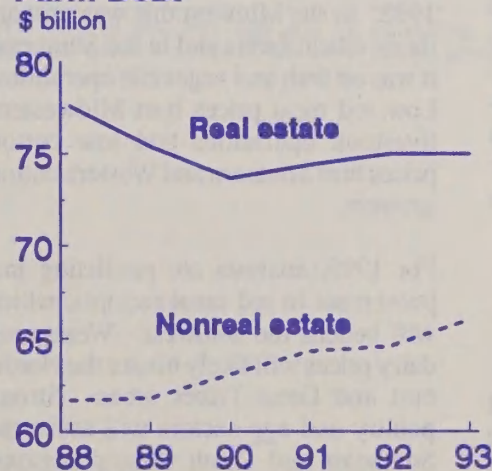
Real Net Farm Income



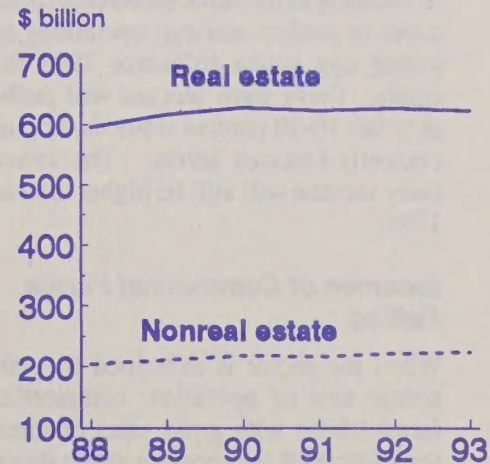
Cash Expenses



Farm Debt



Farm Assets



1992-93 forecast.

Most Farms and Ranches To See Earnings Rise

After 2 years of decline, red meat operations should see higher net incomes in 1993. Regionally, the South Central region will improve the most, in large part due to higher Government payments.

If 1993 production and prices are near the levels currently forecast, most farm businesses are likely to realize higher net incomes than the past few years. Cash grain farms in general are indicating a 2- to 3-percent rise. This is not coming from higher grain prices, however, but from higher direct payments. Cotton farms could be in a similar situation with crop receipts steady to down slightly, but additional direct payments causing net incomes to rise 2-4 percent.

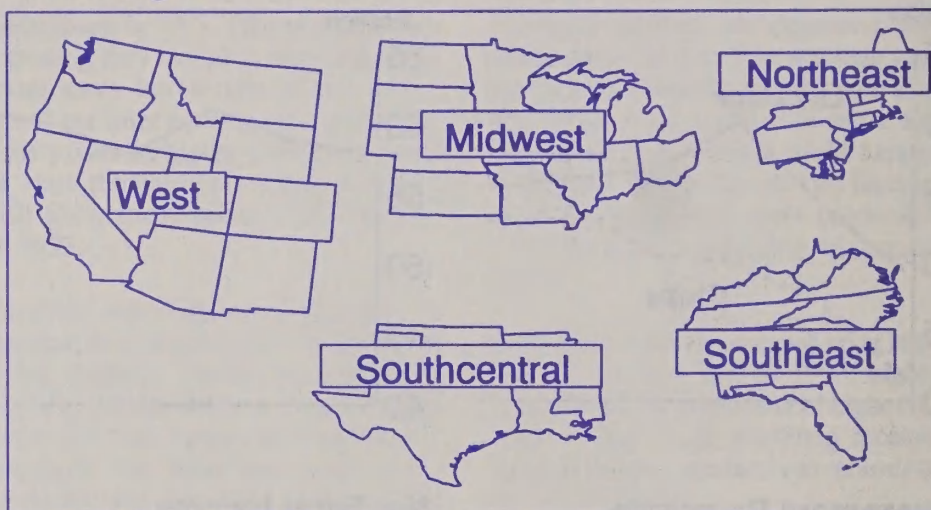
Fruit and vegetable operations do not receive direct payments in any appreciable amount, so if fruit prices remain steady and vegetable prices fall slightly, net incomes for these producers could fall. In every case, incomes are influenced by commodity mix and the operation's particular cost structure, so these farm-type analyses are just general indicators of more complex relationships.

General livestock farms could see net cash incomes drop 2-3 percent next year, primarily due to the influence of lower dairy incomes. With some price recovery in beef and hogs, red meat operations will likely have higher incomes. The largest percentage increase in incomes to livestock producers could come in poultry and egg operations as strong egg prices influence 1993 receipts. Dairy farm income will probably fall 10-20 percent if prices drop to currently-forecast levels. The lower dairy income will still be higher than in 1991.

Incomes of Commercial Farms Falling

When the sector is examined by economic size of operation, commercial farms (those with gross sales of more than \$40,000) are showing slight drops in net cash incomes for next year while the more numerous small, often part-

U.S. Regions



time operations have higher incomes. Higher incomes on the smaller operations can be explained by the relative importance of direct payments to total earnings. On the smallest farms, payments average 6-10 percent of gross cash income, while on the larger commercial farms, payments average 5 percent or less.

Midwest and Southeast Continue Improvement

Many farmers in the Midwest and Southeast saw their net incomes rise in 1992. In the Midwest this was primarily on wheat farms and in the Southeast it was on fruit and vegetable operations. Low red meat prices hurt Midwestern livestock operations and low cotton prices hurt Southern and Western cotton growers.

For 1993, analysts are predicting improvement in red meat receipts, which will benefit the Midwest. Weakening dairy prices will likely hinder the Northeast and Great Lakes areas. Strong poultry and egg sectors will assist the Southeast and South Central regions. The South Central region will likely see the greatest improvement of all, after a

1.4-percent drop in 1992. The 7- to 8-percent increase is primarily due to higher Government payments rather than higher cash receipts.

Costs of Production Up An Average 1 Percent

Field crop production expenses are forecast up slightly from 1992. However, the increase would be less than in previous years. The overall rise in the price index for all production inputs, including interest, taxes, and wages is forecast at 1 percent. Costs of production will likely increase up to 5 percent for chemicals, fuel, farm machines, and labor while interest costs are forecast to decline moderately.

Cash costs per planted acre are forecast to increase an average 1 percent in 1993. The increase will be higher for crops such as rice that use more chemicals, fuels, and labor. Economic (full ownership) costs, which reflect the average long-run costs to keep an acre of land in production, are forecast from almost no change for barley up to 2 percent for rice.

Table 1--Three of five regions showing higher 1993 incomes

Region	Cash receipts		Direct Government payments	Gross cash income	Cash expenses	Net cash income
	Crops	Livestock				
Million dollars						
1992F						
Northeast	4,526	7,433	135	12,521	7,673	4,848
Southeast	14,454	12,788	531	29,595	16,635	12,960
Midwest	31,242	37,284	4,210	75,104	53,959	21,145
South Central	9,165	13,452	1,733	25,500	17,227	8,272
West	24,328	14,824	1,304	41,873	27,071	14,802
1993F						
Northeast	4,558	7,237	170	12,404	7,794	4,610
Southeast	14,456	12,903	696	29,948	16,895	13,053
Midwest	30,657	37,006	6,177	76,237	54,697	21,539
South Central	9,184	13,584	2,385	26,334	17,440	8,894
West	24,391	14,670	1,656	42,162	27,506	14,656

F = forecast.

Table 2--U.S. cash costs of production for major field crops will rise by one percent in 1993

	Corn	Sorghum	Barley	Oats	Wheat	Rice	Soybeans	Cotton
Dollars per planted acre								
Total cash costs 1/ (% change from 1992)	183 (0.5)	104 (1.1)	85 (0.6)	71 (1.0)	82 (0.5)	394 (1.4)	115 (1.0)	365 (0.4)
Variable cash costs (% change from 1992)	139 (0.8)	74 (1.4)	59 (1.2)	49 (0.9)	54 (1.0)	330 (1.4)	74 (1.5)	290 (0.8)
Seed	20	5	7	8	7	21	12	10
Fertilizer	43	18	14	13	15	36	10	27
Chemicals	25	11	8	1	6	48	23	57
Custom operations	6	4	3	7	5	36	4	15
Fuel, lube, and electricity	13	15	9	8	9	64	9	37
Repairs	10	12	9	8	7	33	10	27
Hired labor	10	8	8	6	5	43	7	49
Purchased irrigation water	*	*	2	0	*	7	*	9
Drying	11	0	0	0	0	42	0	0
Ginning	0	0	0	0	0	0	0	61
Miscellaneous	0	0	0	0	0	1	0	0
Fixed cash costs (% change from 1992)	44 (-0.7)	30 (0.3)	25 (-0.9)	22 (1.2)	28 (-0.7)	64 (-0.4)	41 (-0.1)	75 (-0.9)
General farm overhead	13	8	8	4	7	26	11	28
Taxes and insurance	16	14	8	15	11	14	18	17
Interest	14	8	9	3	10	25	12	31
Economic (full ownership) costs (% change from 1992)	302 (0.8)	187 (1.0)	163 (-0.1)	146 (0.1)	131 (0.2)	532 (1.7)	205 (0.9)	524 (1.2)
Variable cash costs	139	74	59	49	54	330	74	290
General farm overhead	13	8	8	4	7	26	11	28
Taxes and insurance	16	14	8	15	11	14	18	17
Capital replacement	39	25	30	26	11	50	20	70
Operating capital	2	1	1	*	1	5	1	4
Other nonland capital	10	18	8	8	12	24	14	19
Land	57	27	35	25	23	55	48	72
Unpaid labor	26	19	14	18	12	28	19	26

* = less than 50 cents. < = less than. Totals may not add due to rounding.

1/ Forecasts are as of 11/27/92 and exclude direct effects of Government programs.

Outlook is for Gradually Improving Financial Position

In a relatively strong 1993 farm economy, the financial performance outlook is for improved current profitability, but limited farm asset growth, slightly rising debt levels, and marginally higher equity.

Farm business assets, debt, and equity are each expected to rise up to 1 percent in 1993. While these moderate increases suggest a stabilizing farm economy, they are projected to lag the general price level rise of 2 to 3 percent. As a result, real (1987\$) asset, debt, and equity levels are forecast to decline 1 to 3 percent. This slight loss in real wealth is not anticipated to create additional financial stress, as the rise in net cash income should provide farm operators with sufficient income to meet their operating and debt service requirements.

Farm Asset Values To Increase Slightly

Total 1993 farm assets are forecast at \$845-\$855 billion, up about 0.5 percent and matching 1992's increase.

The value of farm real estate assets is unchanged for 1992 with land values expected up less than 1 percent in 1993. The stable total farmland value suggests that relatively high cash income levels, even in the presence of favorable interest rates, have not dramatically increased farmers' desire to bid up land prices in attempting to expand operations.

Nonreal estate asset values are forecast to rise almost \$5 billion in 1993, matching 1992's gain. Livestock inventories are expected to account for about 20 percent of this increase, as rising cattle inventories should more than offset an expected decline in year end prices. Cattle account for over 90 percent of the value of all year end livestock inventories. Hog inventory values are expected to decline slightly, due principally to anticipated lower prices. The value of machinery on farms is expected to fall slightly in 1993, while farm business financial assets are projected to increase. The inventory value of stored

crops is anticipated to trend steady to slightly lower, while the value of purchased inputs inventories is forecast to increase modestly.

Farm Debt Up in 1993

Total farm debt is anticipated to increase 1 to 2 percent during 1993 making the third consecutive year of increased indebtedness following a 6-year run of annual debt reductions. Stable land values and healthy cash income of farm borrowers are easing lenders' concern with loan defaults arising from land value declines.

While total farm business debt is forecast to increase slightly during 1993, the loan portfolios of individual lenders may change dramatically. The traditional institutional farm lenders, the Farm Credit System (FCS) and commercial banks, are regaining their financial health as the recovery continues.

Commercial bank lending should rise nearly \$2 billion in 1993, as banks report adequate credit availability for qualified borrowers. Rural banks appear to be in sound financial condition, with most reporting lower than desirable loan-to-deposit ratios. Banks are expected to continue to gain market share in both real estate and nonreal estate lending. By year end 1993, banks are anticipated to hold over 38 percent of all farm debt.

Farm Sector Financial Performance

The farm sector is showing positive signs of recovery, despite the slow decline in real value of farm assets and the gradual erosion of farm equity. Relatively high rates of return on farm equity and assets are expected to continue through 1993.

Other measures of financial performance suggest a stable to modestly improving farm sector during 1993. Farmers are now allocating a smaller portion of their earnings to debt repayment. In 1983, principal and interest payments took 28 percent of gross cash income. With lower debt and more favorable interest rates, only 16 percent of 1993 gross cash income is expected to be needed to meet debt service obligations.

Slightly higher interest expenses in 1993 should not dramatically strain the increased net cash available. Despite the gradual erosion of real farm equity, farmers should have adequate net cash income to fully meet their debt repayment obligations. ERS research suggests that farm operators appear to have the capability to safely and profitably use the sector's growing credit reserves.

Restructuring Evident in Long-Term Balance Sheet Changes

The real value of farm assets in 1993 is at virtually the same as in 1962. However, during the 31-year period, the inflation-adjusted level of farm debt has increased over 16 percent. Real farm equity has generally trended downward since peaking in 1980. Unchanged asset values and a higher debt load suggest that U.S. farming will be operating with higher fixed costs, and, consequently, a less flexible financial structure at the end of 1993 than 31 years earlier.

Given the continued high level of farm earnings, we can expect modest nominal increases in asset values and stabilized debt levels. The farm sector entering 1993 is becoming more cost-efficient, better capitalized, and better positioned for improved profitability.

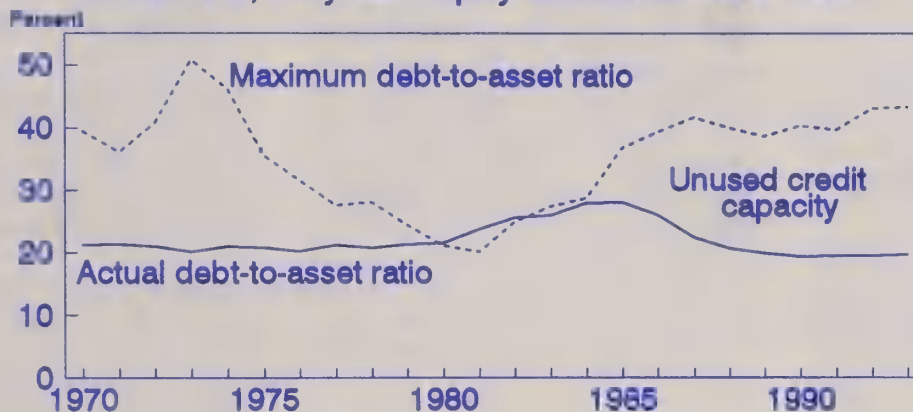
Table 3--Farm balance sheet shows slight improvement in nominal terms but slight decline in real terms.

	1988	1989	1990	1991	1992F	1993F
Billion current dollars						
Assets	800.9	828.9	846.5	841.8	846	845 to 855
Debt	139.4	137.2	136.8	138.8	140	138 to 144
Equity	661.5	691.7	709.7	703.0	707	707 to 715
Billion 1987 dollars 1/						
Assets	770.8	764.0	747.8	714.6	705	685 to 695
Debt	134.2	126.5	120.8	117.8	116	111 to 117
Equity	636.7	637.5	626.9	596.8	588	570 to 580

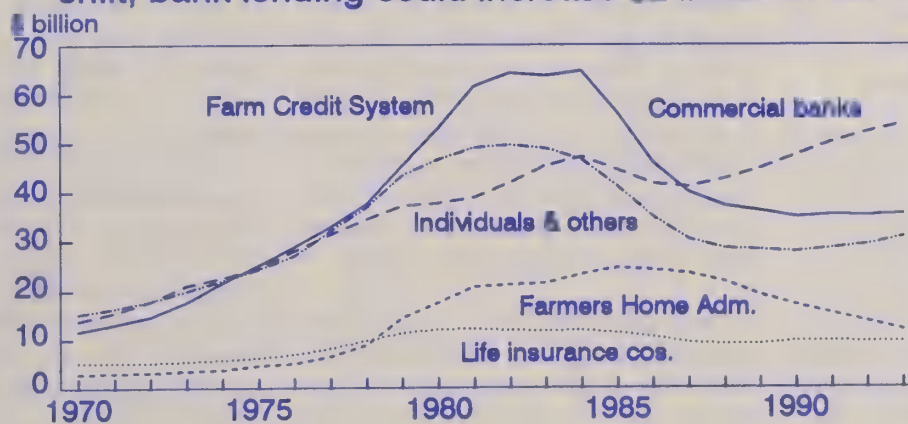
F = forecast. Excludes operator households.

1/ Deflated by the GDP implicit price deflator, 1987=100.

Farm operators exhausted their credit capacity in the 70's; they can repay additional debt now



While total debt is relatively stable, the distribution among farm lenders will continue to shift; bank lending could increase \$2 billion in '93



Economic Growth Improved in the Third Quarter

The economy strengthened in the third-quarter of 1992 as real GDP grew at an annual rate of 3.9 percent after growing 1.5 percent in the second quarter.

Recovery in real Gross Domestic Product (GDP) from its first-quarter 1991 trough has been much slower than most previous recoveries. In 1993, GDP growth is expected to remain below typical recoveries, but may grow somewhat faster than 1992. However, growth in other measures of economic activity has been and will likely remain more uneven. In the third quarter, for example, industrial production and non-farm employment grew only at annual rates of 1.9 and 2.1 percent, respectively.

Sectoral growth should also remain uneven. Consumers are likely to slowly become more optimistic and increase their spending. Business investment spending is expected to add significant strength to the recovery. However, weakness in U.S. exports due to slow growth or recession among many major trading partners will dampen the recovery. The growth outlook for Canada, Japan, Germany, and the U.K., which account for nearly 40 percent of U.S. merchandise trade, is especially weak. Inflation is expected to remain low, reflecting excess capacity in product markets, relatively high unemployment in labor markets, and a continuation of a credible, low-inflation monetary policy.

Implications for Agriculture

Low inflation and low interest rates should keep increases in agricultural input costs modest. However, slow domestic and foreign growth will constrain the growth in the demand for agricultural products. Many analysts expect interest rates to move upward somewhat next year. Should general interest rates rise, agricultural lending rates are also likely to rise, but less than interest rates in general.

Higher Growth in Consumption in Third Quarter

Overall real consumption spending grew at an annualized rate of 3.7-percent in the third quarter, led by a 9.5-percent increase in real consumer spending on durables. In comparison, total consumption and durable goods consumption were roughly unchanged in the second quarter. Despite the increase in third-quarter consumption, consumer spending is unlikely to provide the economy the boost in the 1990's that it did in the 1980's. Consumer spending in the 1980's, which was boosted by a fall in the savings rate from personal disposable income, grew more rapidly than GDP. Specifically, in 1980 the savings rate was 7.9 percent and declined to 4.1 by the end of the decade. When the decline of GDP ended in the first quarter of 1991, the savings rate had risen to 4.7 percent and has thus far averaged 4.9 percent in 1992.

The savings rate is generally viewed as being positively related to the level of real interest rates and negatively related to the level of consumer wealth, consumer confidence, and overall consumer liquidity. Movements in these factors suggest the savings rate is unlikely to fall to the level of the late 1980's. While consumer confidence indexes improved in the late fall, long-run improvement in consumer confidence will continue to be linked to growth in employment and real income. From June through October, total nonfarm employment increased only 17,000.

Consumer wealth, liquidity conditions, and real interest rates also indicate consumption is likely to grow relatively slowly, and that the savings rate is not likely to fall significantly. In the third quarter, real disposable income was roughly unchanged from the second quarter and has grown only 1.8 percent over the last year. Given continued job

uncertainty and uncertain real estate markets in many regions of the country, consumers may continue to rebuild financial assets relative to financial liabilities. The ratio of consumer financial assets to financial liabilities rose from 2.18 at the end of 1987 to 2.36 by the end of the second quarter of 1992. Finally, real interest rates are expected to rise as the recovery strengthens, placing upward pressure on the savings rate.

Business Investment Outlook Is Improving

Business fixed investment was little changed in the third quarter after increasing \$18.9 billion in the second quarter. Most analysts believe business fixed investment spending will increase moderately in 1993 and should be a source of strength to the expansion. Financing constraints, such as the commercial bank credit crunch and high corporate debt burdens, that have constrained investment appear to be easing. However, the growth in business investment spending will be held down by continuing relatively low capacity utilization.

Inventory investment is likely to add further to the recovery. The inventory-to-total sales ratio for manufacturing and trade items averaged a relatively low 1.50. Since first-quarter 1991, the inventory-to-sales ratio has been declining from 1.57. Given current low interest rates and the outlook for stronger final sales, the relatively low inventory-to-sales ratio appears to indicate that inventories are relatively lean. Thus, should expected increases in sales materialize, they are likely to be met by increased production and efforts to rebuild inventories. Insufficient inventory generates costs that jeopardize current sales and long-term customer relationships.

Improved Corporate Financial Situation Strengthens Investment Outlook

Lower interest rates and improved corporate profitability have improved the investment outlook. By refinancing bonds originally issued at high interest rates in the 1980's, firms have reduced their interest costs, improved their profitability, and reduced their costs of funds for investment. For example compared to the previous two quarters, corporate profits of nonfinancial corporations increased \$32.9 billion and interest expenses fell \$5.9 billion in the second and third quarters of 1992. Corporate dividend payments, which in part reflect the long-run earnings outlook of the firm, averaged \$5.2 billion higher in the second and third quarters of 1992 than in the previous two quarters.

Less Overall Reliance on Debt Reduces Investor Risk and Cost of Funds

Firms have further reduced their investment costs in 1991 and 1992 by increasing the relative amount of equity in their capital structures and reducing the amount of debt. When funding an in-

vestment project, the firm either raises funds internally through retained earnings or externally through debt and equity markets. Moreover, the investment must earn a return that adequately compensates its bond and stockholders. The choice of a debt-to-equity mix that minimizes the firm's cost of raising funds for investment depends upon many factors, including expected future profitability, taxes, and expected costs arising from possible financial distress and bankruptcy. In the 1980's, debt-to-equity ratios (on a book-value basis) and interest expenses relative to corporate cash flow rose sharply.

After the 1990-1991 recession, profitability and liquidity ratios were weaker for many firms, raising the likelihood of higher financial distress and bankruptcy costs for investors. The higher perceived risk of financial distress and bankruptcy costs increased the cost of raising capital for investment and encouraged the substitution of equity for debt in many firms' capital structure. Since the third quarter of 1991, firms have reduced their cost of funds for investment purposes by substituting eq-

uity for debt, resulting in reduced financial distress risks for investors.

Interest Rates Likely To Remain Low By Historical Standards

Many analysts are concerned that interest rates will likely rise in 1993. However, a number of factors should minimize interest rate increases, especially in the first half of the year. First, inflation should remain little changed in 1993, given the slack in product and labor markets. Therefore, short-term inflationary expectations are not likely to change appreciably.

Second, if the recovery is moderate and inflation remains under control, the Federal Reserve Board is unlikely to greatly tighten monetary policy. Third, weak growth abroad may pressure foreign central banks to pursue easier monetary policies and reduce foreign interest rates. Lower foreign interest rates should increase foreign demand for U.S. credit market instruments. Fourth, increases in firm profitability and continued efforts to raise funds in equity markets should moderate increases in corporate credit demand.

GDP Growth



Employment Growth



List of Tables

Table

1. Three of five regions showing higher 1993 incomes.....	7
2. U.S. cash costs of production for major field crops will rise by 1 percent in 1993	7
3. Farm balance sheet shows slight improvement in nominal terms but slight decline in real terms	9
A-1. Percentage of farm sole proprietors reporting nonfarm sources of income by farm net profit/loss, 1987	14
A-2. Aggregate nonfarm sources of income by net farm profit(loss)	15
A-3. Average incomes from nonfarm sources reported by farm sole proprietors by net farm profit/loss, 1987.....	16
A-4. Tax characteristics of farm sole proprietors (percentage reporting and mc values) by farm profit/loss, 1987	17
A-5. Aggregate tax characteristics by net farm profit (loss) status	17
B-1. Value added to the national economy by the agricultural sector via the production of goods and services, 1988-91.....	20
B-2. Value added to the national economy by farm business activities in the production of goods and services, omitting value of operators' dwellings, 1988-91	21
B-3. Distribution of net value added to factors including and omitting the value of operators' dwellings	23

Appendix tables

1. Farm income statements, 1988-93	27
2. Relationship of net cash to net farm income 1988-93.....	27
3. Cash receipts, 1988-93	28
4. Farm production expenses, 1988-93.....	29
5. Farm income distribution by enterprise type, 1991-93	30
6. Farm income, assets and debt, and returns, 1988-93.....	31
7. Balance sheet of the farming sector, December 31, 1988-93	32
8. Farm financial ratios: liquidity, solvency, profitability, and financial efficiency, 1988-93.....	33

IRS Estimates of the Aggregate Net Farm Profit (Loss) of Farm Sole Proprietors

by Michael Compson and Ron Durst¹

Abstract: Internal Revenue Service (IRS) estimates of aggregate net farm profit (loss) do not reflect the income situation of farm sole proprietors. Three primary reasons support this conclusion. First, IRS tax file data reveals that nonfarm sources of income are widespread and represent an important source of income, especially for returns reporting a farm loss for tax purposes. Second, the Federal tax code contains various tax preferences that allow individuals to use farming to shelter income from taxation. Finally, not all sources of income directly related to farming are captured in net farm profit (loss). As a result, aggregate IRS estimates of net farm profit (loss) implies an "artificially" high level of financial stress among farmers.

Keywords: Internal Revenue Service, profit, income

Much attention was focused on farmers and their plight during the "farm crisis" of the 1980's. The Internal Revenue Service (IRS) estimates that farm sole proprietors had \$62 billion in net farm losses from 1980 to 1987. The magnitude of these losses seems to support the view of dire conditions for farmers.

However, drawing conclusions regarding the income situation of farm sole proprietors based on aggregate IRS estimates of net farm profit (loss) may be inappropriate. For example, 98 percent of all farm tax returns reported nonfarm income in 1987. In addition, the IRS estimates that 1.3 million farm sole proprietors reported farm losses totaling \$12.1 billion in 1987. This would suggest financial stress for these proprietors. However, these same individuals reported over \$63 billion in nonfarm income.

A second issue which casts doubt on the appropriateness of aggregate net farm profit (loss) as a measure of the income situation of farm sole proprietors is tax shelter investments in agriculture. Federal tax law contains various tax preferences that allow individuals to reduce their tax liabilities by investing in farming. Studies by Woods (1973), Long (1990), and Compson and Durst (1992) reveal that

some individuals use farm investments to generate farm losses to shelter non-farm income from taxation. These losses distort the farm profit (loss) figures since they do not reflect the "true" income situation of farm sole proprietors.

Finally, net farm profit (loss) for tax purposes does not reflect all of the income from the farm operation. For ex-

ample, income from the sale of assets used in the trade or business, such as breeding and dairy livestock, is not included in net farm profit (loss). However, expenses associated with such income is a farm business expense which reduces net farm profit. The sale of assets used in a trade or business amounts to several billion dollars annually for farm sole proprietors.

IRS and USDA Farms Differ

This article uses the 1987 IRS Public Use Tax File. The unit of analysis in this paper is the tax filing unit, farm sole proprietors reporting farm income or loss for tax purposes. Given this, any references to farms, farmers, and farm returns are referring to the IRS definition of farm sole proprietors. The IRS tax file is a unique source of data that allows researchers to examine both nonfarm income and tax characteristics by farm profit (loss) reported for tax purposes.

The IRS estimates of both farm and nonfarm income should not be confused with USDA estimates of income for farm operator households. IRS and USDA estimates are based on different populations and are undertaken for different purposes. As a result, those who can file as farm sole proprietors for tax purposes include many, but not all, of those the U.S. Department of Agriculture defines as farmers. A significant share of the individuals who operate the largest U.S. farms operate as partnerships and corporations and therefore do not file income tax returns as farm sole proprietors.

In addition, individuals are eligible to file as farm sole proprietors for tax purposes who are not considered farmers by the U.S. statistical survey. An example are those whose farms do not have the potential to sell at least \$1,000 of agricultural products annually. These distinctions are important to avoid any potential confusion between the two data sources.

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Table A-1--Percentage of farm sole proprietors reporting nonfarm sources of income by farm net profit/loss, 1987

Farm profit/loss	Number of Schedule F returns	Wages and salaries	Taxable interest	Tax exempt interest	Dividends	Nonfarm business profit/loss	Nonfarm capital gains 1/	Other income 2/
Percent								
Farm sole proprietors reporting loss of:								
\$500,000 or more	762	59	94	33	79	57	53	94
\$200,000 - \$500,000	2,913	64	99	14	74	49	53	93
\$100,000 - \$200,000	7,724	62	96	14	58	39	69	82
\$50,000 - \$100,000	19,152	63	87	17	51	33	60	75
\$25,000 - \$50,000	48,962	73	93	11	42	29	44	77
\$10,000 - \$25,000	185,318	79	87	6	37	23	31	60
0 - \$10,000	1,101,728	78	84	4	32	23	26	59
All farm sole proprietors reporting loss	1,366,559	77	85	5	34	24	29	60
Farm sole proprietors reporting profit of:								
0 - \$10,000	773,022	57	86	3	25	18	23	48
\$10,000 - \$25,000	160,997	60	89	1	28	20	24	38
\$25,000 - \$50,000	86,798	56	88	4	41	11	38	46
\$50,000 - \$100,000	28,641	49	98	12	44	25	42	60
\$100,000 - \$200,000	3,162	49	10	14	58	15	37	76
\$200,000 - \$500,000	975	68	10	19	52	27	64	80
\$500,000 or more	156	74	97	31	82	40	52	85
All farm sole proprietors reporting profit	1,053,751	57	87	3	28	18	25	47
All farm sole proprietors	2,420,310	69	86	4	31	21	27	54

Source: 1987 IRS Individual Public Use Tax File.

1/ Nonfarm capital gains are equal to capital gains reported on Schedule D minus gains from the sale of assets used in a trade or business. 2/ Other sources of income include gross pensions and social security benefits, unemployment compensation, and rents and royalties reported on Schedule E.

Data and Variables

Most analyses examining the distribution and sources of income for farmers use farm survey data. This analysis uses the 1987 IRS Individual Public Use Tax file, the first to reflect the dramatic changes of the Tax Reform Act of 1986. IRS data have several distinct advantages over survey data. One advantage is greater detail regarding specific nonfarm sources of income compared to most survey data. A second advantage is information pertaining to various tax items and payments typically not available from alternative sources. In addition, IRS tax file data allows unique insight into reported nonfarm sources of income and tax characteristics by net farm profit (loss) reported for tax purposes.

The 1987 IRS tax file contains a sample of tax returns that reflect the 2,420,310 individuals who filed a farm sole proprietors. These individuals reported an aggregate net loss of \$1.4 billion with an average net farm loss of \$576. Fifty-seven percent of the farm sole proprietors reported a farm loss.

The sources of nonfarm income examined included wages and salaries, inter-

est income, tax exempt interest income, dividends, nonfarm business profits/losses, nonfarm capital gains/losses, and other income consisting of gross pensions and Social Security benefits, unemployment compensation, and rents and royalties.

The nonfarm capital gains reported in the analysis do not include gains from the sale of property used in a trade or business which would be eligible for capital gains treatment. In farming, this would include such assets as farm machinery and equipment, breeding and dairy livestock, and farmland. While it is impossible to determine the exact portion of reported capital gains directly related to farming from the tax file, it is assumed that the \$4.7 billion reported from the sale of assets used in a trade or business is directly related to farming and hence, does not constitute nonfarm income.²

² The sale of such assets is assumed to be farm related income, but the gains are not included in farm income since the analysis focuses on IRS estimates of farm profit (loss).

The tax characteristics examined included self-employment taxes, Federal income taxes, the alternative minimum tax, total passive losses, and passive losses disallowed.

Farm Returns Reporting Nonfarm Sources of Income

Ninety-eight percent of all farm sole proprietors reported nonfarm income from one or more sources. The primary source of nonfarm income was taxable interest income, followed by wages and salaries, and other income (table A-1). The least reported was tax exempt interest income, with only 4 percent of all farm sole proprietors reporting such income.

A comparison of the percentages of farm sole proprietors reporting the various sources of nonfarm income by net farm profit (loss) status demonstrates the importance of nonfarm income for returns reporting a farm loss. Farm sole proprietors reporting a loss were more likely to report each of the nonfarm sources of income, except for taxable interest, than those with a profit. Approximately 77 percent of the farm sole proprietors with a loss reported wages and salaries, compared to only 57 per-

cent of those reporting a profit. The percentage of farmers reporting a loss with income from dividends, nonfarm business profits/losses, and other income are also slightly higher than for farmers reporting a profit. There is very little difference among the remaining categories of nonfarm income.

Except for wages and salaries, the percentage of farmers with losses reporting each of the nonfarm sources of income increases with the level of farm losses. This general pattern also persists, with minor exceptions, for farm proprietors reporting profits. Nearly 80 percent of farm sole proprietors with losses of \$10,000 or less reported income from wages and salaries. This suggests that farming may not be the primary occupation for these individuals.

Aggregate Values and Distribution of Nonfarm Sources of Income

Wages and salaries is the largest source of nonfarm income followed by other income and taxable interest income (table A-2). The distribution of the nonfarm sources of income by farm profit (loss) status is very revealing. Over two-thirds of the total amount of each of the nonfarm sources of income reported was received by individuals with farm losses. The highest concentrations of nonfarm sources of income earned by those reporting a loss were nonfarm capital gains (79 percent), nonfarm business profits (76%), and dividends and wages and salaries (75 percent). A disproportionate amount of several of the nonfarm sources of income was reported by farm sole proprietors reporting farm losses in excess of \$100,000. While these returns constitute less than 2 percent of those reporting each of the nonfarm sources of income, they accounted for 24 percent of nonfarm capital gains, 21 percent of tax exempt interest, 19 percent of dividend income, and 11 percent of taxable interest income.

Nearly three-quarters of total nonfarm income was earned by farm sole proprietors reporting a loss.³ While farm sole proprietors with losses in excess of \$100,000 constitute less than 0.5 percent of the farm proprietors reporting nonfarm income, they had 6 percent of total nonfarm income. Correspond-

Table A-2--Aggregate nonfarm sources of income by net farm profit(loss)

Nonfarm sources of income 1/	Aggregate amount reported Thousand dollars	Percent of nonfarm income for returns reporting farm	
		Profit	Loss
Wages and salaries	48,070,431	25	75
Taxable interest income	10,226,960	33	67
Tax exempt interest income	1,559,858	31	69
Dividend income	3,031,277	25	75
Schedule C profit/loss	3,365,908	24	76
Nonfarm capital gains/loss	7,497,863	21	79
Other income	12,306,471	29	71
Total nonfarm income	86,434,538	26	74
Total income	90,594,284	39	61

Source: 1987 IRS Individual Public Use Tax File
1/ See text for description of variables.

ingly, the majority of nonfarm income was reported by farms with losses smaller than \$100,000. These same farmers also reported the majority of aggregate farm losses. Ninety-one percent of the farm returns reporting a loss reported nonfarm income equal to or greater than their farm loss. Nearly 60 percent of the farm returns with a profit reported nonfarm income greater than their farm profits. This is further evidence that farming may not be the primary source of income for many farm sole proprietors.

Average Values of Nonfarm Sources of Income

The average total nonfarm income for farm returns reporting a net farm loss was \$42,101, about 2-1/2 times the \$17,641 reported by farmers with a net farm profit. The average total income for those reporting a net loss was \$35,878, compared to \$29,659 for those with a profit. Thus, farm returns reporting a loss from farm operations averaged 40 percent more total income than those with a profit from farm operations. The largest average nonfarm source of income for returns reporting such income is wages and salaries at \$28,926 followed by tax exempt interest of \$16,148 and nonfarm capital gains of \$11,402 (table A-3). The smallest average source of nonfarm income is

dividends at \$4,037 per return reporting dividend income.

In summary, the average values of each of the nonfarm sources of income are greater for farm sole proprietors reporting a loss than for those reporting profits. The largest divergence in nonfarm sources of income by farm net profit (loss) status is \$14,747 for salaries and wages. The smallest difference is \$2,250 for interest received. The relative rankings of the nonfarm sources of income in terms of their importance are very similar across farm profit (loss) status. The average value of each of the nonfarm sources of income, except for nonfarm business profits/losses, increases with the level of farm losses reported.

Federal Tax Liabilities and Other Characteristics

The IRS tax file provides detailed information regarding tax liabilities for farm sole proprietors. An examination of the Federal income and self-employment tax liabilities of farm sole proprietors reveals that while only a small percentage of farmers reporting a loss paid self-employment taxes, most paid Federal income taxes. This confirms the importance of nonfarm income sources for these farmers. A larger percentage of the farms reporting profits paid self-employment taxes than farms reporting losses (table A-4). Since the self-employment tax is levied on farm profits, this should be expected.

Eighty percent of the farmers reporting profits paid some self-employment taxes. The average tax was \$1,432. Only 15 percent of the farm proprietors reporting a loss paid self-employment

³Total nonfarm income is equal to total income minus farm profit (loss) and gains (losses) from the sale of assets used in a trade or business. Total income is equal to adjusted gross income plus unreimbursed employee business expenses, primary and secondary IRA contributions, Keogh payments, early withdrawal of savings penalty, alimony paid, and untaxed pensions and Social Security benefits.

Table A-3--Average incomes from nonfarm sources reported by farm sole proprietors by net farm profit/loss, 1987 1/

Farm profit/loss	Wages and salaries	Taxable interest	Tax exempt interest	Dividends	Nonfarm Business profit/loss	Nonfarm capital gains 2/	Other income 3/
	Dollars						
Farm sole proprietors reporting loss of:							
\$500,000 or more	311,240	592,772	208,500	292,824	-429,083	667,870	34,971
\$200,000 - \$500,000	219,365	108,763	317,588	100,527	4,179	283,224	54,214
\$100,000 - \$200,000	148,124	56,217	131,304	44,211	26,306	120,614	26,214
\$50,000 - \$100,000	101,085	25,992	34,489	20,063	21,932	61,034	47,317
\$25,000 - \$50,000	51,511	12,387	24,812	12,594	18,896	26,106	10,696
\$10,000 - \$25,000	39,042	6,619	13,981	6,360	8,251	15,069	10,483
0 - \$10,000	30,617	3,939	8,045	2,244	7,465	6,869	9,481
All farm sole proprietors reporting loss	34,282	5,921	16,743	4,952	7,941	15,221	10,626
Farm sole proprietors reporting profit of:							
0 - \$10,000	21,521	3,515	13,224	2,584	4,706	5,000	8,479
\$10,000 - \$25,000	11,683	2,812	31,456	2,283	1,739	6,878	5,129
\$25,000 - \$50,000	14,574	4,414	8,088	1,882	5,130	4,236	645
\$50,000 - \$100,000	11,807	6,365	12,832	3,130	7,951	12,133	9,347
\$100,000 - \$200,000	52,720	16,879	64,038	8,219	4,277	37,224	-30,660
\$200,000 - \$500,000	77,939	29,025	69,801	30,661	-4,946	29,931	-4,875
\$500,000 or more	1,174	182,163	130,917	66,938	-298,434	177,618	-207,353
All farm sole proprietors reporting profit	19,535	3,671	14,961	2,588	4,224	5,789	7,175
All farm sole proprietors reporting off-farm income	28,926	4,930	16,148	4,037	6,564	11,402	9,335
All farm sole proprietors	19,861	4,225	644	1,252	1,390	3,098	5,085

Source: 1987 IRS Individual Public Use Tax File.

1/ Except for the last row, the total for all farm sole proprietors, all averages were calculated only for returns reporting the off-farm source of income. 2/ Nonfarm capital gains is equal to capital gains reported on Schedule D minus gains from the sale of assets used in a trade or business. 3/ Other income includes gross pensions and social security benefits, unemployment compensation, and rents and royalties reported on Schedule E.

taxes. The average was \$1,509. These farmers either received income from a nonfarm trade or business or elected to pay self-employment taxes based on gross income from farming in order to establish coverage for social security benefits. Farm returns reporting a profit paid \$1.2 billion in self-employment taxes, compared to the \$316 million paid by those with a loss (table A-5).

A much higher percentage of farmers paid Federal income taxes, 89 percent of all returns. The remaining 11 percent did not have sufficient farm or nonfarm income to be subject to the Federal income tax. Ninety-six percent of the farms reporting a profit paid Federal income taxes, with an average payment of \$5,554. Not surprisingly, a smaller percentage, only 83 percent, of farmers with a farm loss paid Federal income taxes. However, their average tax was considerably higher at \$7,758 per return. Farm sole proprietors reporting a profit paid \$5.6 billion in Federal income taxes, compared to \$8.8 billion for those reporting a loss (table A-5).

Unfortunately little information can be inferred from the reporting of a farm

loss with regard to the nature or purposes of the activities that resulted in the losses. However, certain tax variables do provide some insight into the use of tax preferences and the nature of the taxpayer's involvement in such activities. These include the alternative minimum tax and passive losses.

The alternative minimum tax is designed to ensure that individuals who would otherwise be able to substantially reduce or even eliminate their tax liability through the use of tax preferences, pay at least some Federal income tax. Only 0.5 percent of all farm sole proprietors are affected by the alternative minimum tax. However, those reporting a loss were three times more likely to be affected by the tax than farm returns with a profit. The average alternative minimum tax payments across farm profit (loss) status are comparable.

In total, \$166 million in alternative minimum tax payments were made by farm sole proprietors (table A-5). Approximately 80 percent of the payments were from farm sole proprietors reporting a loss. Farm returns with losses exceeding \$100,000 accounted for 29

percent of the payments made, but only 8 percent of those paying the alternative minimum tax.

The Tax Reform Act of 1986 (TRA) limits the use of passive losses to offset nonpassive income. A passive activity includes a trade or business, such as farming, in which the taxpayer or the taxpayer's spouse does not participate by providing either management or labor for the farm business. Passive losses generated from investments made before the TRA was enacted were phased out over a 5 year period, ending in 1991. In 1987, only 10 percent of such losses were disallowed.

Approximately 10 percent of farm returns reported passive losses. The average loss was over \$20,000. Farm returns reporting a loss were twice as likely to report passive losses relative to farm returns reporting a profit.⁴ The

⁴ Since the passive loss rules are applied on an individual farm basis, it is possible for a farm sole proprietor to report a net farm profit and a passive loss.

Table A-4--Tax characteristics of farm sole proprietors (percentage reporting and mean values) by farm profit/loss, 1987

Farm profit/loss	Self-employment taxes		Federal income taxes		Alternative minimum tax		Passive losses		Passive losses disallowed	
	% 1/	Mean	%	Mean	%	Mean	%	Mean	%	Mean
Farm sole proprietors reporting loss of:										
\$500,000 or more	14	4,132	58	336,943	17	94,408	61	804,713	32	303,468
\$200,000 - \$500,000	21	1,828	63	190,714	15	35,692	46	120,278	24	53,821
\$100,000 - \$200,000	11	1,487	59	89,205	6	40,390	34	103,526	16	40,588
\$50,000 - \$100,000	18	2,151	84	51,864	7	14,205	34	64,303	18	31,234
\$25,000 - \$50,000	16	1,911	62	23,664	2	9,672	25	32,717	10	15,019
\$10,000 - \$25,000	14	1,611	76	9,604	2	8,812	15	20,708	7	9,456
0 - \$10,000	15	1,459	86	5,500	0.3	7,769	10	12,628	4	6,132
All farm sole proprietors reporting loss	15	1,509	63	7,758	0.7	12,908	12	22,646	5	10,904
Farm sole proprietors reporting profit of:										
0 - \$10,000	75	672	95	3,891	0.1	13,846	4	9,040	1	4,513
\$10,000 - \$25,000	94	2,089	98	5,411	0.7	6,077	3	13,658	0.1	52,830
\$25,000 - \$50,000	98	4,030	99	10,890	0.1	20,597	5	20,099	3	8,911
\$50,000 - \$100,000	97	5,254	99.9	19,762	0.4	7,150	15	9,947	4	4,736
\$100,000 - \$200,000	89	5,238	99.9	46,379	0.1	173,490	26	38,297	4	45,231
\$200,000 - \$500,000	84	5,224	99	100,686	3	18,024	53	55,074	27	19,547
\$500,000 or more	79	4,067	96	1,074,861	13	47,436	53	155,474	30	56,997
All farm sole proprietors reporting profit	80	1,432	96	5,554	0.2	11,181	5	12,143	1	7,595
All farm sole proprietors returns reporting tax characteristics	NA	1,447	NA	6,720	NA	12,521	NA	20,038	NA	10,400
All farm sole proprietors	44	630	89	5,966	0.5	68	9	1,719	3	343

Source: 1987 IRS Individual Public Use Tax File. NA = not applicable.
1/ Percentage of returns reporting.

Table A-5--Aggregate tax characteristics by net farm profit (loss) status

Tax characteristics 1/	Aggregate amount reported	Percent of tax characteristics for returns reporting farm	
		Profit	Loss
	Thousand dollars	Percent	Percent
Federal Income Tax	14,441,580	39	61
Self-Employment Tax	1,527,024	79	21
Alternative Minimum Tax	166,407	20	80
Reported Passive Losses	4,162,005	14	86
Disallowed Passive Losses	830,833	11	89

Source: 1987 IRS Individual Public Use Tax File.
1/ See text for description of variables.

average passive loss for farm returns reporting a loss was \$22,646, nearly twice that for farm returns reporting a profit. Eighty-six percent of the \$4.1 billion in passive losses reported by farm returns were reported by farm returns with a loss (table A-5). Farm returns with losses in excess of \$100,000 constitute 2 percent of all farm returns reporting passive losses and 20 percent of all passive losses.

Only 9 percent of all farm returns actually had losses that were not allowed to offset other income. Farm sole proprietors reporting a loss were 5 times more likely to have disallowed passive losses

than those reporting a profit. The average disallowed loss for returns with a farm loss was \$3,500 greater than those reporting a profit. Farm returns with a loss reported 89 percent of the \$830 million in disallowed passive losses. Farm returns with losses in excess of \$100,000 constitute 3 percent of all returns with disallowed passive losses and 20 percent of all disallowed losses.

The majority of the alternative minimum tax payments, passive losses, and disallowed passive losses are reported by farm returns with losses. While a disproportionate amount of returns affected by the minimum tax and the pas-

sive loss rules are concentrated in returns with losses in excess of \$100,000, the majority of the minimum tax and passive losses are reported by farmers with losses smaller than \$100,000. While the tax file does not identify if the alternative minimum tax payments or passive losses reported by farm sole proprietors are directly related to farming, this behavior is consistent with the reporting of farm losses for tax purposes.

Conclusion

Any conclusions regarding the income situation of farm sole proprietors based solely on IRS aggregate net farm profit (loss) are flawed for several reasons. First, 98 percent of all farm sole proprietors reported nonfarm income. Evidence suggests that farming is not the primary source of income for many farm sole proprietors. Second, an examination of various tax characteristics which are indicators of tax shelter activity, such as the minimum tax and the passive losses, suggests that a number of those individuals reporting a farm

loss may be farming primarily to lower their tax liabilities. Farms reporting a loss were three times more likely to be affected by the minimum tax and five times more likely to report a passive loss. Finally, net profit (loss) for tax purposes does not include all sources of farm income. The most important source excluded, income from the sale of assets used in a trade or business, is estimated to amount to several billion dollars each year. As a result, aggregate IRS estimates of net farm income (loss) imply a level of financial stress among farmers that is "artificially" high.

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Value-added for the U.S. Agricultural Sector

by Roger Strickland and Cheryl Johnson¹

Abstract: A measure of value-added was estimated and included, for the first time, in the upcoming issue of *Economic Indicators of the Farm Sector: National Financial Summary, 1991*. This article explains the concept's significance both nationally and globally. Information is provided about its conceptual framework and the calculation method, along with details of the accounts included in the new series. How value-added relates to other published income measures is also explained.

Keywords: Value added, farm income, farm accounting

Value-added is used by many analysts, particularly those whose work involves income accounting of production in non-agricultural sectors and who do sector accounting in other countries. For example, communications over time from analysts in the Organization for Economic Cooperation and Development (OECD) have sought U.S. agricultural financial data for inclusion in their value-added models, which are very similar in concept to the one described here. The development and publication of this value-added measure gives such analysts an accounting of the U.S. farm sector income in a familiar format.

Net farm income and net value-added are sister concepts, each distinct in its own right and clearly related to each other. Net farm income reflects value-added by a group of production factors that are a subset of those contributing to the larger, more encompassing measure of value-added. The reconciliation of the two measures should facilitate a better understanding of the component accounts, by introducing analysts to the myriad statistics in the USDA net farm income accounts which describe the sector in great detail (table B-1).

Significance

A significant benefit to be derived from the value added concept is an analytical tool in looking at the agricultural sectors in various countries to under-

stand their national policies and changing rates of growth over time. The conceptual consistency of this measure with the statistics regularly computed by and reported for the European Community (EC) is of particular significance because of the EC's importance to the U.S. farm sector. The EC is rapidly becoming a giant player in what is now a global economy, both as a trade competitor seeking export markets and as a trade partner offering large, affluent markets for commodities that the U.S. can currently produce in large surplus.

The EC member countries, currently an area encompassing Greece and Italy in the south to Denmark and the Netherlands in the north, are already major players in international trade for agricultural products. By 1996, the EC is projected to be an economic union of 16 countries and 340 million people which will likely grow as it expands to incorporate East European nations.

Occupying much the same latitudes in the Northern Hemisphere, the EC countries and the U.S. produce a similar mix of agricultural commodities in the same growing seasons. For those commodities produced in large quantities, the EC and the U.S. have considerable potential to produce for export and frequently are competitors seeking to sell to the same third-party countries.

With per capita incomes among the highest in the world, consumers in the EC countries and U.S. generate an effective demand for large volumes of commodities, which often cannot be satiated by domestic production. The deficit in one country creates a market for the importation of commodities,

which are in surplus and available from another country.

The EC will continue to be a union of independent countries with often disparate and conflicting priorities and objectives for their respective agricultural sectors. The current efforts to create a much higher level of integration in the economies of the EC countries via policies established to achieve common goals have the potential to cause, in future years, severe interruptions in the currently established agricultural production programs and import/export policies of individual countries.

There will continue to be a need to monitor and analyze the performance of each country's economy and its agricultural component in order to discern and anticipate evolving economic pressures for change. The development across countries of statistics with a common conceptual base facilitates analysis of sector performances and structural changes.

The EC represents but a few of many countries of the world that offer significant competition and/or markets to the U.S. farm sector. Some, most notably the Pacific Rim area, may also attempt to form unions of some degree to gain additional leverage in world markets. Other countries, such as China and Brazil, are large enough to be of consequence even if they never engage in cooperative endeavors with neighboring countries. Value-added statistics will provide a tool for analysis of the agricultural economies in many of these and, in return, give them a basis to gain a better understanding of the U.S. farm sector.

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Table B-1--Value added to the national economy by the agricultural sector via the production of goods and services, 1988-91 1/

Item	1988	1989	1990	1991
Million dollars				
Final crop output (sales)	69,288	81,863	83,155	80,155
Food grains	7,474	8,247	7,512	6,823
Feed crops	14,298	17,054	18,690	19,012
Cotton	4,546	5,033	5,489	5,589
Oil crops	13,500	11,866	12,294	12,547
Tobacco	2,083	2,415	2,741	2,886
Fruits and tree nuts	9,202	9,296	9,534	9,882
Vegetables	9,788	11,534	11,455	11,293
All other crops	10,772	11,435	12,284	12,514
Home consumption	164	142	146	122
Value of inventory adjustment 2/	-2,539	4,842	3,010	-514
Final animal output (sales)	79,138	84,645	90,917	88,210
Animals (meat)	55,992	58,863	64,139	63,760
Cattle & calves	36,810	36,894	39,945	39,632
Hogs	9,207	9,475	11,552	11,061
Sheep & lambs	476	487	414	399
Poultry	9,801	11,510	11,233	11,202
Home consumption	567	526	543	503
Value of inventory adjustment 2/	-867	-30	452	962
Animal products	23,146	25,781	26,778	24,451
Dairy products	17,641	19,396	20,210	18,114
Eggs	3,067	3,862	4,010	3,861
Miscellaneous livestock	2,437	2,524	2,557	2,476
Services and forestry	12,476	13,728	12,663	12,917
Machine hire and customwork	1,475	1,711	1,798	1,672
Forest products sold	1,940	2,110	2,137	2,179
Other farm income	3,664	4,419	3,288	3,794
Gross imputed rental value of farm dwellings	5,397	5,488	5,440	5,271
Final agricultural sector output	160,902	180,236	186,735	181,282
less: Intermediate consumption outlays	80,539	85,212	87,574	88,838
Farm origin	36,516	37,698	39,114	38,133
Feed purchased	20,393	21,002	20,706	19,800
Livestock and poultry purchased	12,764	13,138	14,832	14,358
Seed purchased	3,359	3,558	3,576	3,975
Manufactured inputs	18,716	20,027	21,063	21,687
Fertilizers and lime	6,947	7,249	7,135	7,419
Pesticides	4,577	5,437	5,718	6,313
Petroleum fuel and oils	4,903	4,798	5,730	5,472
Electricity	2,289	2,543	2,480	2,483
Other intermediate expenses	25,307	27,487	27,398	29,018
Repair and maintenance of capital items	6,858	7,340	7,346	7,234
Machine hire and customwork	2,354	2,682	2,633	2,722
Marketing, storage, and transportation expenses	3,450	4,080	4,046	4,532
Contract labor	1,143	1,154	1,355	1,596
Miscellaneous expenses	11,502	12,231	12,018	12,934
plus: Net government transactions	9,343	5,469	3,329	1,912
less: Direct Government payments	14,480	10,887	9,298	8,214
less: Motor vehicle registration and licensing fees	289	291	346	322
less: Property taxes	4,848	5,127	5,623	5,980
Gross value added	89,706	100,494	102,489	94,356
less: Capital consumption	17,345	17,779	17,493	17,350
Net value added	72,361	82,715	84,996	77,006
less: Employee compensation	9,298	9,956	11,186	10,999
Net operating surplus	63,063	72,759	73,810	66,007
less: Net rent received by nonoperator landlords	7,290	8,187	8,334	7,464
less: Real estate and nonreal estate interest	14,677	14,691	14,518	13,934
Net farm income	41,096	49,881	50,958	44,609

1/ Component statistics are drawn from the net farm income accounts and include income and expenses related to the farm operator dwellings. The concept presented is consistent with that employed by the Organization for Economic Cooperation and Development. 2/ A positive value of inventory change represents current-year production not sold by December 31. A negative value is an offset to production from prior years included in current-year sales.

The format in which the value-added account is developed and presented in this report is accomplished through a rearrangement of components of the farm income accounts, while adhering closely to international accounting concepts. The presentation format provides an introduction to the USDA income accounts for those who are knowledgeable about value-added but unfamiliar with the USDA income accounts.

Income and payment statistics found in value-added can be matched to statistics found in other parts of the previously mentioned *Economic Indicators* publication with the assurance that the measures are identical in definition. Also, a reconciliation of the difference in net farm income and net value-added is presented using additional components of the income accounts.

The Concept of Value-Added

Net value-added is an accounting concept providing the broadest possible measure of an agricultural sector's contribution to the general economy.² Income is created through the production of goods and services and accrues to the contributing factors of production; thus, income is equal to value-added. In measuring the contributions of labor, land, and capital to a national economy by agriculture, a measure of the income accruing to the owners/providers of these factors (lenders, employees, landlords, and operators) is simultaneously derived.

Net value-added is an income concept that provides a comprehensive perspective on both the level and trend in the value of a particular sector's production. Used in conjunction with net farm income, net value-added provides additional insight into understanding economic activity within the sector, reflect-

² The U.S. Department of Commerce (USDC) has established specific accounting rules for estimating gross domestic product originating in farming. However, our measure of value added differs from the official USDC estimate and readers should use caution when comparing the two estimates. These differences are discussed later in the article. The USDC NIPA estimate of 1991 gross domestic product originating in farming is \$79.1 million compared to our value added estimate of \$94.4 million.

Table B-2--Distribution of net value added to factors including and omitting the value of operators' dwellings

	1988	1989	1990	1991
Including value of operators' dwellings:				
	Million dollars			
Net value added	72,361	82,715	84,996	77,006
	Percent			
Shares				
Lenders	20	18	17	18
Hired Labor	13	12	13	14
Landlords	10	10	10	10
Proprietors	57	60	60	58
Omitting value of operators' dwellings:				
	Million dollars			
Net value added	70,299	80,589	83,031	75,103
	Percent			
Shares				
Lenders	20	18	17	18
Hired Labor	13	12	13	15
Landlords	10	10	10	10
Proprietors	56	60	60	57
Numbers may not add due to rounding.				

ing both the increase in output arising from gains in productivity and the changing mix of commodities produced as a result of structural changes.

As an accounting concept, gross value-added for an agricultural sector is the value of production, which is or will be sold, minus the costs of the production inputs purchased from other sectors of a nation's economy. Gross and net value-added differ by the value of capital consumption, i.e., accounting for capital goods with a useful life extending beyond 1 year requires that the annual value consumed be amortized over many years rather than be fully expensed in the year purchased.

Net value-added can be described as the residual after deduction for exhaustible inputs used in the production process; that is to say purchased inputs consumed in a one-time application and depreciation charges for capital consumption. Purchased inputs are defined to include services, such as repairs to machinery, application of pesticides, and artificial insemination. Net value-added is distributed to farm creditors, employees, landowners, and the farm operator-manager (residual profits) in accordance to market-determined shares (table B-2).

Original designers of value-added accounting systems would have considerable latitude in defining the various sectors of the economy. However, the U.S.

Department of Commerce has established specific standards for the National Income and Product Accounts (NIPA). With some exceptions we have chosen to accept these standards for developing our estimates of value-added from farming even though the inclusion or exclusion of a particular activity from the farm sector could be debated.

For national income accounting, the establishment is the basic unit of account, not the firm. Thus, for example, if a farmer operated a custom harvesting business in conjunction with the farm, the key to whether the farmer has one or two business establishments for NIPA purposes is whether the farmer keeps separate records for each business. If the farmer keeps separate records for the custom harvesting activity, then it is not part of the farm sector.

Similarly, farm labor is included in net value-added to agriculture only if the payments are made directly to individual workers. This is consistent with the criteria established for the definition of employees. Contracted labor, however, is not considered as part of the farm sector because the service is hired through a crew boss, which is considered a business entity and defined to be outside of the farm sector.

We have not conformed to NIPA standards in our treatment of rents paid to nonoperator landlords. Land is a specialized form of capital, and the net rent

accruing to nonoperator landlords simply reflects the contribution of the land provided to the sector by nonoperator landlords. For that reason, we have chosen to include rent paid to nonoperator landlords as value added from farming. USDC allocates this rent to the real estate sector.

Relationship to Net Farm Income

Conceptually, value-added has much in common with net farm income, because both reflect a net value of production of goods and services. The two concepts are in agreement in accounting for the total of the sector's final production of goods and services, whether sold or consumed within the sector as food, feed, and seed, without benefit of a market transaction. The difference is that net value-added encompasses the contributions and earnings of a larger block of resources than does net farm income.

Net farm income reflects only the earnings accruing to those contributing factors of production—capital, labor, land, and management—owned by operators, defined as those individuals sharing in the risks of production and marketing. Value-added is the income created from the contributions of all factors of production employed within the agricultural sector, including those of nonoperators. Thus, in an accounting sense, net value-added has fewer deductions. Net value-added is the sector's value of final production less only those amounts paid to other sectors of the national economy.

Net farm income, on the other hand, reflects the income created from production activities by a subset of the factors of production, namely those owned by the individuals and business entities sharing in the risks of production. Thus, additional deductions are made, beyond those of net value-added, for payments to factors of production for which the earnings are not a function of the profits generated from the farm business.

Entities defined as sharing in the risks of production encompass not only the individual proprietor—traditionally viewed as the family farmer—but the myriad group of individuals and legal entities who contribute capital in many forms including, among others, the

owners of animals placed in feedlots for finishing and the passive investor contributing only capital in expectation of receiving dividends.

As an accounting measure, value-added would be expected to exceed net farm income because expenditures by farm operators for interest, wages, and rent for factors of production owned by nonoperators are a net addition to value-added while treated as deductions in calculating net farm income. A reconciliation of the differences between value-added and net farm income is accomplished by rearranging the component accounts historically developed for net farm income. Net farm income, as the residual accruing to the operators' factors of production, can be computed from net value-added by taking additional deductions for payments of wages, interest, and net rent expenses. (Net rent is gross rent due the landlords less farm expenses paid by the landlord.)

Net value-added and net farm income each measure a net value of production (with differences in the deductions), as opposed to a more profit-oriented definition of income typically computed under financial reporting standards used in determining income tax obligations and financial results of interest to owners, lenders, and prospective investors. A principal difference in concept distinguishing the two from measures of profit is that the gross product or gross farm income encompasses more than simply how much was sold in exchange for money in a given year. A second difference is the omission of gains and losses from price changes for financial and capital assets, because these do not result from production.

Accounting for Production Not Sold

The parameters inherent in the definition of the value-added measure developed are the same as those of net farm income, namely, that the accounting is of the net value of *production of commodities and services occurring within the U.S. farm sector in a given calendar year*. These parameters underlie some of the components of the accounting model that appear not to be well understood by the occasional user and thus are more prone to being misinterpreted.

The confusion arises largely because these measures are not a part of the cash accounting methods used in determining tax obligations, which are an income model familiar to nearly everyone because of the necessity of annually filing tax forms.

The *imputed value of change in farm commodity inventories* makes possible the calendar year accounting for production. A positive change connotes a production surplus destined for sale after the year of production. The added increment to inventories credits the production to the year of occurrence. In contrast, a negative change is the result of a drawdown in beginning stocks and represents a sale of commodities produced in prior years. The negative inventory value serves to offset the inclusion of the sales in cash receipts for the given year. The offset is necessary to achieve calendar year accounting because the commodities were previously accounted for in an earlier year as an addition to inventories.

Home consumption is the value of produce consumed on the farm where produced without ever having been sold. Having never been subjected to a market transaction, home consumption is not reflected in sales statistics collected. Conceptually, its inclusion is appropriate in order to account for all production from the sector having utility, and thus value, to a consumer. Practically, home consumption must be included because expenses associated with its production cannot be determined nor omitted from business expenses.

The net rental value of dwellings represents the benefits of housing services derived by occupants from those residences located on farms. Conceptually, in sector accounting, structures located on farms are defined as part of the farm sector. The productive benefits gained from service buildings are considered to be realized via the value of the final products and services created, similar to the treatment of production used on farms where produced. In income and tax accounting for farm business expenses, laborers' dwellings are generally accepted as capital inputs eligible for business deductions related to maintenance and depreciation.

Table B-3--Value added to the national economy by farm business activities in the production of goods and services, omitting value of operators' dwellings, 1988-91 1/

Item	1988	1989	1990	1991
Million dollars				
Final crop output (sales)	69,288	81,863	83,155	80,155
Food grains	7,474	8,247	7,512	6,823
Feed crops	14,298	17,054	18,690	19,012
Cotton	4,546	5,033	5,489	5,589
Oil crops	13,500	11,866	12,294	12,547
Tobacco	2,083	2,415	2,741	2,886
Fruits and tree nuts	9,202	9,296	9,534	9,882
Vegetables	9,788	11,534	11,455	11,293
All other crops	10,772	11,435	12,284	12,514
Home consumption	164	142	146	122
Value of inventory adjustment 2/	-2,539	4,842	3,010	-514
Final animal output (sales)	79,138	84,645	90,917	88,210
Animals (meat)	55,992	58,863	64,139	63,760
Cattle and calves	36,810	36,894	39,945	39,632
Hogs	9,207	9,475	11,552	11,061
Sheep and lambs	476	487	414	399
Poultry	9,801	11,510	11,233	11,202
Home consumption	567	526	543	503
Value of inventory adjustment 2/	-867	-30	452	962
Animal products	23,146	25,781	26,778	24,451
Dairy products	17,641	19,396	20,210	18,114
Eggs	3,067	3,862	4,010	3,861
Miscellaneous livestock	2,437	2,524	2,557	2,476
Services and forestry	7,387	8,534	7,557	7,941
Machine hire and customwork	1,475	1,711	1,798	1,672
Forest products sold	1,940	2,110	2,137	2,179
Other farm income	3,664	4,419	3,288	3,794
Gross imputed rental value of laborers' dwellings	308	294	334	295
Final agricultural sector output	155,813	175,042	181,628	176,307
less: Intermediate consumption outlays	79,715	84,535	86,794	88,074
Farm origin	36,516	37,698	39,114	38,133
Feed purchased	20,393	21,002	20,706	19,800
Livestock and poultry purchased	12,764	13,138	14,832	14,358
Seed purchased	3,359	3,558	3,576	3,975
Manufactured inputs	18,716	20,027	21,063	21,687
Fertilizers and lime	6,947	7,249	7,135	7,419
Pesticides	4,577	5,437	5,718	6,313
Petroleum fuel and oils	4,903	4,798	5,730	5,472
Electricity	2,289	2,543	2,480	2,483
Other intermediate expenses	24,483	26,810	26,617	28,254
Repair and maintenance of capital items	6,243	6,847	6,754	6,669
Machine hire and customwork	2,354	2,682	2,633	2,722
Marketing, storage, and transportation expenses	3,450	4,080	4,046	4,532
Contract labor	1,143	1,154	1,355	1,596
Miscellaneous expenses	11,293	12,047	11,829	12,735
plus: Net government transactions	9,878	6,052	3,956	2,543
Direct Government payments	14,480	10,887	9,298	8,215
less: Motor vehicle registration and licensing fees	289	291	346	322
less: Property taxes	4,313	4,544	4,996	5,350
Gross value added	85,976	96,559	98,790	90,775
less: Capital consumption	15,677	15,970	15,759	15,672
Net value added	70,299	80,589	83,031	75,103
less: Employee compensation	9,298	9,956	11,186	10,999
Net operating surplus	61,001	70,633	71,845	64,104
less: Net rent received by nonoperator landlords	7,290	8,187	8,334	7,464
less: Real estate and nonreal estate interest	14,185	14,191	14,029	13,466
Returns to operators	39,526	48,255	49,482	43,174

1/ Component statistics are drawn from the returns to operator accounts and do not include income and expenses related to operator dwellings. 2/ A positive value of inventory change represents current-year production not sold by December 31. A negative value is an offset to production from prior years included in current-year sales.

Data considerations also provide practical reasons for including operators' dwellings in the farm sector. Survey data collected for expenses are generally inclusive of dwellings. The exclusion of expenses associated with the operators' dwellings from those incurred with other farm structures is not considered to be a common practice in farm recordkeeping systems.

The value of the rental services rendered by the dwellings is the only component missing of those necessary to estimate the sector's income indicators. Farmers' financial records, used to develop the data bases for the sector accounts, exclude a valuation of dwelling rental services. Gross imputed rent is determined and explicitly included as a separate line item in valuing the gross product, expressly to correct this omission. The only alternative, estimating the dwelling components of expenses for purposes of adjusting the original data, can only lower the quality of the data because of the introduction of subjectivity.

A common error made in interpreting the *gross imputed rent* is to confuse it with the net value of imputed rent and thus to treat it as the contribution of farm dwellings to the "bottom line," whether it be net value-added or net farm income. Gross imputed rent is a component of gross farm output before deductions of associated expenses. The contribution of operator dwellings to the bottom line is the net imputed rent and is determined as the gross imputed rent less the associated expenses. Proportionally, net rent typically is about a fourth of the gross rent. (In the farm income accounts, imputed net rent to operators' dwellings can be explicitly determined as the difference between net farm income and returns to operators.)

Some analysts, particularly those with interests oriented to commercial farm policy, production agriculture, or the business aspects of farming, prefer to work with income statistics that do not include the rental services from operators' dwellings. One concern is the more than one million farms with gross sales of less than \$10,000, which is an obvious indication that each operation produces modest quantities of agricultural output.(1) In some cases, the

value of the residential services rendered by the house may conceivably equal or exceed the value of the sales of agricultural commodities.

For purposes of sector accounting, the official definition of the farm sector requires that these establishments be included, but this is not to say that analysts can't segment the population of farms or restructure the accounting to do comparative or selective analysis.(2) USDA estimates returns-to-operators in addition to net farm income for the convenience of analysts wishing to exclude operators dwellings.

For the same reason, analysts are provided with a value-added accounting for the sector in which operators' dwellings are omitted from both output and expenses (table B-3). The reader should be aware that the omissions may be damaging to the quality of the resulting estimates. As discussed earlier, expense data, which include the operators' dwellings are survey-based, while estimation of the expenses associated with the dwellings for purposes of omission is often judgmental due to the absence of explicit, reliable data.

The accounting for commodities used for production on the same farm where produced is a special case. Two obvious examples are grain used for crop seed and livestock feed. The value is reflected in the market transaction that occurs with the future disposition of the additional production to which a contribution was made. Thus the value of farm produce so used would not be explicitly reflected in either cash receipts or the inventory statistics for that commodity because the produce did not leave the farm in its original form. For example, grain fed to cows is reflected in the beef or milk production attributable to the feed.

The Accounting Model

In its simplest form, the value-added accounting model is a summation of the sector's output within a calendar year, which are or will be used in other sectors less the purchases of productive inputs from the other sectors. Productive inputs include both products and services. Capital inputs with a useful life of more than a single year are am-

ortized and accounted for at replacement value.

Transactions between the government sector and the agricultural sector are combined in a separate account for emphasis. Payments to governments go mainly to local governments to pay those charges necessary to be allowed to conduct a business—property taxes, licenses, motor vehicle registration fees. Because the payments would not have occurred in the absence of the business, they are production expenses incurred by the agricultural sector but paid to the local and State governments. Income taxes are excluded because they are not a determinant of production. Income taxes are considered a function of production, being determined after the fact.

NIPA procedures treat direct government payments as transfers to the farm sector. Thus, payments are not included in USDC's GDP from farming. However, we include them as a component of value-added to farming. Payments received from governments are benefits paid directly to farmers by the national government to achieve goals established in support of national security, conservation, and food supplies. Because these direct government payments are not based on the specific needs relative to the income situation of individual producers, they are considered to be production-based income and not transfer payments from taxpayers to producers.

The USDA has historically included government payments as a source of gross income in the farm income accounts because these payments, and the production responses that they are intended to induce, are a component of the market forces determining production and prices. Production and prices would almost certainly be different in the absence of government intervention. By the same reasoning, these payments are included in the definition of value-added. For comparison, the line item "Gross farm income" in net farm income accounting exceeds "Final agricultural sector output" in value-added accounting by the amount of direct government payments, because it is by definition a component of the former measure and not the latter.

The sector's final output is recorded in three accounts—crop, animal, and non-commodity (table B-1). (Final refers to the stage of removal from one sector to another, for example, the farm gate.) Total crop output is sales of commodities harvested in the given year plus additional amounts from the year's harvest that are still in inventory at the end of the year but destined for sale at a future time. As a reminder, unsold quantities from the current year's production are denoted by positive changes in inventories, whereas negative changes in inventories indicate sales in excess of the current year's harvest and thus from stocks carried over from the prior year.

Livestock output is recorded in two components—animals and animal products. Changes in livestock inventories reflect only live animals. Livestock products (eggs, milk, etc.) are perishable and do not remain for long in farm storage but are quickly removed from the farm into a subsequent processing and/or marketing stage. Home consumption of farm-produced commodities, as a non-market disposition, is assigned an estimated value based on prices received by farmers for comparable produce.

Non-commodity farm output is the value of services and non-agricultural products produced from farm sector resources. Examples of such services are custom work performed for other businesses using equipment belonging to the farm and renting of farm land to others for recreational purposes (hunting). Timber is treated as a forestry product rather than agricultural and timber sold by establishments classified as farms is recorded as farm-related income. The treatment of Christmas trees is the subject of some debate as they are trees but the producing establishments have many of the operating attributes of farms. At the current time, sales of Christmas trees are reflected mainly in the forestry products component of farm-related income, with the balance under other crops.

Intermediate consumption outlays are expenses incurred to provide intermediate inputs for use in production. All such expenses are cash purchases of inputs that are fully used within a year. Intermediate consumption outlays have

three component accounts—those of farm origin, manufactured inputs, and other intermediate inputs, which are primarily labor and services. With the exception of the manufactured inputs, some portion of the expenses could be for transactions with other participants in the agricultural sector, as opposed to a third party (broker, merchant, middleman, etc.) outside the sector. In the case of intra-sector sales, an offset in one of the output sections will serve to negate effects on gross and net value-added.

Gross value-added is a measure of an agricultural sector's contributions to that nation's economy before making allowance for that portion of capital goods consumed in the production. It is the value of goods and services produced during the year for use by other sectors less cash purchases from the other sectors. Thus, it includes the value of the capital stock used; in effect selling off a portion of the sector's capital. *Net value-added* is the sector's contribution after making allowances for the maintenance of the capital stock through replacement at current prices, not original purchase prices.

Data Limitations

Two principal components within the conceptual framework of value-added are not computed in calculating net farm income. These are (1) own account formation (breeding livestock and other) and (2) value of physical change in input stocks (opening stocks minus ending stocks). Most farmers use the cash-accounting method for tax reporting, as opposed to accrual accounting. Thus, their recordkeeping systems reflect when inputs were purchased rather than when used and only report production as sales but do not report changes in inventory.

Currently, information is not available to separate breeding stock from the "work (production) in progress" animals. Additions to and sales of breeding stock are accounted for in cash receipts and value of change in inventories (herd size); but data are insufficient to separate breeding stock from animals destined for other dispositions. Data on yearend stocks of inputs, in combination with annual purchases, would allow a determination of the amount actually used each year.

If farmers maintain a regular pattern to their purchases and use of inputs, and indications are that they do, then utilization would be correlated with purchases; and the lack of data on stocks of inputs would have little impact on the determination of value-added in the aggregate. Differences would occur on individual farms, but that is not the focus of the aggregate sector accounts.

Summary

Net value-added is the net economic contribution of the farm sector's production activities and is also a measure of the share of the output that remains in the farm sector to reward all participants who have committed land, labor, capital, and management skills to production. Because it explicitly accounts for the payments made for the use of productive resources in farming (wages, interest, rent, and management returns), net value-added highlights the economic impact of resources used in agricultural production in the form of returns that accrued to these resources.

Net value-added complements the USDA's longest running, most often used income indicator, net farm income (available for years since 1910). Because net farm income is a component of net value-added, the latter yields additional information about a larger universe of production resources. Component accounts common to the two measures are conceptually the same. Because net value-added includes the earnings of factors not owned by the operators and net farm income does not, the difference and the proportions provide insight about the sector's structure.

For example, the \$32.4 billion by which net value-added exceeds net farm income in 1991 is attributable to the factors of production not owned by the operators. In that year, employees received \$11 billion; landlords, \$7.5 billion; and lenders, \$13.9 billion. The proportions or shares received by lenders, hired laborers, landlords, and proprietors/operators were 18 percent, 14 percent, 10 percent, and 58 percent, respectively. Changes over time in the amounts and the proportions are a reflection of input market conditions, gains in productivity, and trends in ownership of the factors.

Currently, plans are to continue the estimation of this value-added measure for the U.S. accounts and to publish the tables presented here in future issues of *Economic Indicators*. The information required to develop a longer historical time-series is readily available in the previously published farm income accounts. Likewise, the information necessary to develop a value-added measure for individual States is also available within the existing income accounts. Analysts with an interest in doing so,

should be able to construct estimates employing the model exhibited in table B-1.

Consideration will be given to publication of value-added for earlier years and/or for states, if there appears to be sufficient interest among analysts. (Readers may send suggestions and comments to USDA/ERS, Rm. 936, 1301 New York Ave. N.W., Washington D.C. 20005-4708. Telephone (202) 219-0806.)

References

1. *Farm Numbers, Land, and Land in Farms*, [Sp Sy (7-92)], published by National Agricultural Statistics Service, U.S. Department of Agriculture. July 30, 1992, p. 10.
2. Strickland, Roger P. "The Negative Income of Small Farms," *Agricultural Economics Research*, Vol. 35, No. 1, Jan. 1983, pp. 52-55.

Appendix table 1--Farm income statements, 1988-93

Item	1988	1989	1990	1991P	1992F	1993F
Billion dollars						
Cash income statement						
1. Cash receipts	151.1	161.0	169.9	167.3	169	165 to 172
Crops 1/	71.7	76.9	80.0	80.5	84	81 to 86
Livestock	79.4	84.1	89.9	86.7	85	83 to 87
2. Direct Government payments	14.5	10.9	9.3	8.2	8	9 to 13
Cash Government payments	7.1	9.1	8.4	8.2	8	9 to 13
Value of PIK commodities	7.4	1.7	.9	.0	*	0 to 1
3. Farm-related income 2/	7.1	8.2	7.2	7.6	7	6 to 8
4. Gross cash income (1+2+3)	172.7	180.2	186.4	183.2	185	183 to 191
5. Cash expenses 3/,4/	114.6	121.2	125.2	125.2	124	123 to 129
6. NET CASH INCOME (4-5)	58.1	58.9	61.3	58.0	60	58 to 64
Deflated (1987\$) 5/	55.9	54.3	54.1	49.2	50	46 to 52
Farm income statement						
7. Gross cash income (1+2+3)	172.7	180.2	186.4	183.2	185	183 to 191
8. Nonmoney income 6/	6.1	6.2	6.1	5.9	6	5 to 7
9. Inventory adjustment	-3.4	4.8	3.5	.4	4	-5 to -1
10. Total gross income (7+8+9)	175.4	191.1	196.0	189.5	195	186 to 195
11. Total expenses	134.3	141.2	145.1	144.9	144	143 to 149
12. NET FARM INCOME (10-11)	41.1	49.9	51.0	44.6	51	42 to 48
Deflated (1987\$) 5/	39.5	46.0	45.1	37.9	42	33 to 39

P = preliminary; F = forecast. * = less than \$500 million.

1/ Includes CCC loans. 2/ Income from custom work, machine hire, recreational activities, forest product sales, and other farm sources. 3/ Excludes depreciation and perquisites to hired labor. 4/ Excludes farm households. 5/ Deflated by the GDP implicit price deflator. 6/ Value of home consumption of farm products and imputed rental value of operator dwelling. Totals may not add due to rounding.

Appendix table 2--Relationship of net cash to net farm income 1988-93

Item	1988	1989	1990	1991P	1992F	1993F
Billion dollars						
Gross cash income	172.6	180.2	186.4	183.2	185	183 to 191
Minus cash expenses	114.6	121.2	125.2	125.2	124	123 to 129
Equals net cash income	58.0	58.9	61.3	58.0	60	58 to 64
Plus nonmoney income						
Gross rental value of dwelling	6.1	6.2	6.1	5.9	6	5 to 7
Value of inventory change	-3.4	4.8	3.5	.4	4	-5 to -1
Minus noncash expenses						
Labor perquisites	.5	.5	.5	.5	1	0 to 1
Capital cons. exc. dwellings	15.8	16.0	15.8	15.7	16	15 to 17
Minus dwelling expenses						
Capital consumption	1.5	1.8	1.7	1.7	2	1 to 2
Interest	.5	.5	.5	.5	*	0 to 1
Taxes	.5	.6	.6	.6	1	0 to 1
Repair & maintenance	.6	.5	.6	.6	1	0 to 1
Insurance	.2	.2	.2	.2	*	0 to 1
Equals net farm income	41.1	49.9	51.0	44.6	51	42 to 48

P = preliminary; F = forecast. * = less than \$500 million.

Appendix table 3--Cash receipts, 1988-93

Item	1988	1989	1990	1991P	1992F	1993F
Billion dollars						
Crop receipts: 1/						
Food grains	7.5	8.2	7.5	6.8	9	7 to 9
Wheat	6.4	7.3	6.4	5.7	7	6 to 8
Rice	1.1	.9	1.1	1.1	1	1 to 2
Feed grains and hay	14.3	17.1	18.7	19.0	20	18 to 22
Corn	8.9	11.4	13.4	13.9	15	14 to 16
Sorghum, barley, and oats	2.2	2.3	2.0	2.1	2	1 to 3
Oil crops	13.5	11.9	12.3	12.5	13	11 to 13
Soybeans	12.1	10.5	10.8	10.8	11	10 to 12
Peanuts	1.1	1.1	1.3	1.4	1	1 to 2
Cotton lint and seed	4.5	5.0	5.5	5.6	4	4 to 6
Tobacco	2.1	2.4	2.7	2.9	3	2 to 4
Fruits and nuts	9.2	9.3	9.5	9.9	10	9 to 12
Vegetables	9.8	11.5	11.5	11.3	12	11 to 13
Greenhouse & nursery	7.1	7.6	8.2	8.4	9	8 to 9
TOTAL CROPS	71.6	76.9	80.0	80.5	84	81 to 86
Livestock receipts:						
Red meats	46.5	46.9	51.9	51.1	48	45 to 53
Cattle and calves	36.8	36.9	39.9	39.6	38	36 to 41
Hogs	9.2	9.5	11.6	11.1	10	10 to 11
Sheep and lambs	.5	.5	.4	.4	*	0 to 1
Poultry and eggs	12.9	15.4	15.2	15.1	15	14 to 18
Broilers	7.4	8.8	8.4	8.4	9	8 to 10
Turkeys	2.0	2.2	2.4	2.3	2	2 to 3
Eggs	3.1	3.9	4.0	3.9	3	2 to 4
All dairy products	17.6	19.4	20.2	18.1	20	17 to 20
TOTAL LIVESTOCK	79.4	84.1	89.9	86.7	86	83 to 87
TOTAL RECEIPTS	151.1	161.0	169.9	167.3	170	165 to 172

P = preliminary; F = forecast. * = less than \$500 million. Totals may not add due to rounding.

1/ Includes sugar, seed, and other miscellaneous crops.

Appendix table 4--Farm production expenses, 1988-93

Item	1988	1989	1990	1991P	1992F	1993F
Billion dollars						
Farm-origin inputs	36.5	37.7	39.1	38.1	38	35 to 39
Feed	20.4	21.0	20.7	19.8	20	18 to 22
Feeder livestock	12.8	13.1	14.8	14.4	14	12 to 16
Seed	3.4	3.6	3.6	4.0	4	3 to 5
Manufactured inputs	18.9	20.0	21.1	21.7	21	20 to 24
Fertilizer	6.9	7.2	7.1	7.4	7	5 to 9
Fuels and oils	4.9	4.8	5.7	5.5	5	4 to 7
Electricity	2.3	2.5	2.5	2.5	2	2 to 4
Pesticides	4.6	5.4	5.7	6.3	7	5 to 7
Total interest charges	14.7	14.7	14.5	13.9	14	12 to 16
Short-term interest	6.8	6.9	6.9	6.6	6	5 to 8
Real estate interest	7.9	7.8	7.6	7.3	7	6 to 8
Other operating expenses	34.4	37.7	38.9	40.3	40	39 to 44
Repair and maintenance	6.9	7.3	7.3	7.2	7	7 to 9
Labor expenses	10.4	11.1	12.5	12.6	12	10 to 14
Machine hire & custom work	2.4	2.7	2.6	2.7	3	2 to 4
Animal health	1.3	1.5	1.5	1.4	1	0 to 2
Marketing, storage & transportation	3.5	4.1	4.0	4.5	5	4 to 6
Miscellaneous operating expenses	10.0	11.0	10.9	11.9	12	10 to 14
Other overhead expenses	29.4	31.1	31.4	30.8	31	30 to 33
Capital consumption	17.3	17.8	17.5	17.4	18	16 to 20
Taxes	4.8	5.1	5.6	6.0	6	5 to 7
Net rent to non-operator landlords	7.3	8.2	8.3	7.5	8	7 to 9
Total production expenses	134.3	141.2	145.1	144.9	144	143 to 149
Noncash expenses	16.3	16.4	16.3	16.2	16	16 to 17
Labor perquisites	.5	.5	.5	.5	1	0 to 1
Capital consumption excluding dwellings	15.8	16.0	15.8	15.7	16	15 to 17
Dwelling expenses	3.4	3.6	3.6	3.5	4	3 to 4
Capital consumption	1.5	1.8	1.7	1.7	2	1 to 2
Interest	.5	.5	.5	.5	*	0 to 1
Taxes	.5	.6	.6	.6	1	0 to 1
Repair & maintenance	.6	.5	.6	.6	1	0 to 1
Insurance	.2	.2	.2	.2	*	0 to 1
Cash expenses 1/	114.6	121.2	125.2	125.2	124	123 to 129

P = preliminary; F = forecast. * = less than \$500 million.

1/ Total production expenses minus noncash and operator dwelling expenses.

Appendix table 5--Farm income distribution by enterprise type, 1991-93 1/

Item	Crops					Livestock			
	Total crops	Cash grain 2/	Cotton	Tobacco	Fruit/nut/vegetable	Total livestock	Red meat	Poultry and eggs	Dairy
Thousands									
Number of farms:									
1991	827	421	24	55	107	1,289	981	38	167
1992	817	415	23	55	105	1,273	969	37	165
1993	806	410	23	84	104	1,256	957	37	163
Billion dollars									
Income:									
1. Cash receipts--									
Crops									
1991	73.3	31.2	6.4	3.0	18.2	7.3	5.7	.1	1.3
1992	76.3	33.1	5.8	3.1	19.3	7.7	6.0	.1	1.4
1993	75	32	6	3	19	8	6	*	1
Livestock									
1991	5.8	4.6	.2	.5	.2	79.6	42.4	13.8	20.4
1992	5.5	4.3	.1	.5	.2	78.9	40.3	13.6	22.0
1993	6	4	■	■	*	78	40	14	21
2. Direct Government payments--									
1991	5.8	4.7	.6	.1	.2	2.4	1.7	.0	.6
1992	5.6	4.5	.6	.1	.2	2.3	1.7	.0	.6
1993	5	6	1	■	*	3	2	■	1
3. Gross cash income-- 3/									
1991	88.7	41.8	7.6	3.7	19.1	93.1	51.7	14.0	23.3
1992	91.1	43.3	6.9	3.7	20.2	92.5	49.7	13.9	25.0
1993	93	44	7	4	20	93	50	14	24
4. Cash expenses--									
1991	56.2	26.9	3.6	2.7	8.1	68.7	38.0	8.4	18.5
1992	55.8	26.7	3.6	2.7	8.0	68.1	37.5	8.4	18.3
1993	57	27	4	3	■	69	38	■	18
5. Net cash income									
1991	32.5	14.9	4.0	.9	11.0	24.4	13.6	5.7	4.9
1992	35.3	16.5	3.4	1.0	12.2	24.4	12.2	5.4	6.7
1993	36	17	3	1	12	24	12	6	5
Deflated (1987\$)									
1991	27.6	12.6	3.4	.8	9.3	20.7	11.6	4.8	4.1
1992	29.2	13.7	2.8	.8	10.1	20.2	10.1	4.5	5.5
1993	29	14	3	1	10	19	10	5	4
Balance sheet 5/									
6. Farm assets--									
Real estate									
1991	262.6	118.0	7.8	12.1	70.8	360.8	254.5	10.9	57.3
1992	264.1	118.7	7.9	12.1	71.2	362.9	256.0	10.9	57.7
1993	268	121	8	12	72	368	260	11	59
Nonreal estate									
1991	88.2	52.8	4.2	3.9	10.4	130.3	86.3	2.4	33.1
1992	90.1	54.0	4.3	3.9	10.6	133.1	88.2	2.4	33.8
1993	91	54	4	4	11	134	89	2	34
7. Total liabilities--									
1991	63.5	37.3	3.3	2.5	8.5	75.2	43.7	3.9	22.5
1992	63.9	37.5	3.3	2.5	8.6	75.7	44.0	3.9	22.7
1993	65	38	3	3	9	77	45	4	23
Percent									
8. Debt-to-asset ratio--									
1991	18.1	21.8	27.3	15.8	10.5	15.3	12.8	29.6	24.9
1992	18.0	21.7	27.2	15.8	10.5	15.3	12.8	29.5	24.8
1993	18.0	21.7	27.2	15.7	10.5	15.2	12.8	29.4	24.8

1991 is preliminary; 1992 and 1993 are forecast. ■ = less than \$500 million. Numbers are rounded.

1/ Farm types are defined as those with 50 percent or more of the total value of production accounted for by a specific commodity or commodity group. 2/ Includes farms earning at least half their receipts from sales of wheat, corn, soybeans, rice, sorghum, barley, oats, or a mix of cash grains. 3/ Equals 1 + 2 + farm related income. 4/ Equals 3 - 4. 5/ Excludes farm households.

Appendix table 6--Farm income and returns, balance sheet, and rates of return, 1988-93

Item	1988	1989	1990	1991	1992F	1993F
Billion dollars						
Income and total returns:						
1. Gross farm income 1/	170	186	191	185	195	189 to 193
2. Wages and perquisites to hired labor	9	10	11	11	10	10 to 12
3. Other operating expenses, excluding interest	84	89	92	94	94	93 to 97
4. Capital consumption	16	16	16	16	16	14 to 16
5. Net income from assets and operators' labor and management (1-2-3-4)	61	71	72	64	75	67 to 71
6. Income imputed to operators' labor and management	26	28	30	29	34	32 to 36
7. Residual income to farm assets (5-6)	35	42	42	36	41	33 to 37
8. Real capital gains on assets	2	-8	-21	-32	-10	-13 to -17
9. Total return to assets (7+8)	37	34	21	3	30	
10. Interest paid	14	14	14	13	13	12 to 14
11. Real capital gains on debt	6	6	7	6	3	3 to 5
12. Total return to equity (9-10+11)	29	27	14	-5	20	9 to 11
13. Real capital gains on equity (8+11)	8	-1	-14	-27	-7	-9 to -11
14. Residual income to farm equity (12-13)	21	28	28	22	28	19 to 23
Balance sheet:						
15. Assets	801	829	847	842	846	845 to 855
16. Debt	139	137	137	139	140	138 to 144
17. Equity (15-16)	662	692	710	703	707	705 to 715
Percent						
Rates of return and interest rates						
18. Rate of return on assets (ROA) (7/15)	4.4	5.1	5.0	4.2	4.8	3 to 5
19. Real capital gain on assets (8/15)	0.2	-0.9	-2.5	-3.8	-1.2	-1 to -2
20. Total real return on assets (18+19)	4.6	4.2	2.5	0.4	3.6	2 to 3
21. Average interest rate paid on debt (10/16)	10.2	10.3	10.3	9.7	9.4	9 to 10
22. Real capital gains on debt (11/16)	4.2	4.7	5.0	4.1	2.2	2 to 3
23. Real cost of debt (21-22)	6.0	5.6	5.3	5.6	7.2	6 to 7
24. Rate of return on equity (ROE) ((7-10)/17)	3.1	4.0	4.0	3.1	3.9	2 to 4
25. Real capital gain on equity ((8+11)/17)	-0.6	-2.0	-4.0	-5.4	-1.9	-2 to -3
26. Total real return on equity (24+25)	2.6	2.0	0.0	-2.3	2.0	0 to 1
27. Net return on assets (NROA) (18-21)	-5.8	-5.3	-5.3	-5.5	-4.6	-5 to -6
28. Spread (20-23) 4/	-1.4	-1.5	-2.8	-5.2	-3.6	-4 to -5

F = forecast. Numbers may not add due to rounding. 1/ Excludes operator dwellings. 2/ Numbers in parentheses indicate components required to calculate a given item. 3/ Excludes operator households and CCC activity. 4/ When total real rate of return on assets exceeds total real cost of debt, debt financing is profitable.

Appendix table 7--Farm business balance sheet, 1988-93

Item	1988	1989	1990	1991	1992F	1993F
Billion dollars						
Farm assets	800.9	828.9	846.5	841.8	846	845 to 855
Real estate 1/	595.5	615.5	627.5	623.4	623	620 to 630
Livestock and poultry	62.2	66.2	70.9	68.4	72	71 to 75
Machinery and motor vehicles	81.0	84.5	84.3	83.7	83	81 to 85
Crops stored 2/	23.3	23.4	22.8	23.6	23	21 to 25
Purchased inputs	3.5	2.6	2.8	2.5	3	2 to 4
Financial assets	35.4	36.8	38.3	40.3	42	41 to 45
Farm debt	139.4	137.2	136.8	138.8	140	138 to 144
Real estate 3/	77.6	75.4	73.7	74.4	75	73 to 77
Nonreal estate	61.7	61.8	63.1	64.3	65	64 to 66
Farm equity	661.6	691.8	709.8	703.1	707	705 to 715
Selected ratios:						
Debt-to-asset	17.4	16.5	16.2	16.5	16.5	16 to 17
Debt-to-equity	21.1	19.8	19.3	19.7	19.8	19 to 21
Debt-to-net cash income	240.1	232.8	223.2	239.4	231.6	220 to 240

F = forecast. 1/ Excludes value of operator dwellings and includes real estate values not included in the 1987 Census of Agriculture and other BRS real estate series. 2/ Non-CCC crops held on farm plus value above loan rate for crops held under CCC. 3/ Includes CCC storage and drying facility loans.

Appendix table 8--Farm financial ratios: liquidity, solvency, profitability, and financial efficiency, 1988-93

Ratios	1988	1989	1990	1991	1992F	1993F
Ratio						
Liquidity ratios:						
Farm business debt service coverage 1/	2.36	2.41	2.50	2.39	2.5	2.4 to 2.6
Debt servicing 2/	0.18	0.17	0.16	0.16	0.2	.1 to .2
Times interest earned ratio 3/	3.80	4.40	4.51	4.20	3.8	3.2 to 3.3
Percent						
Solvency ratios:						
Debt/asset 4/	17.4	16.5	16.2	16.5	16.5	16 to 17
Debt/equity 5/	21.1	19.8	19.3	19.7	19.8	19 to 20
Percent						
Profitability ratios:						
Return on equity 6/	3.1	4.0	4.0	3.1	3.9	2 to 4
Return on assets 7/	4.4	5.1	5.0	4.2	4.8	3 to 5
Net farm to gross cash farm income 8/	23.8	27.7	27.3	24.4	29.9	26 to 27
Percent						
Financial efficiency ratios:						
Gross ratio 9/	66.4	67.3	67.1	68.4	67.3	66 to 68
Interest to gross cash farm income 10/	8.2	7.9	7.5	7.4	7.7	7 to 8
Asset turnover 11/	21.9	22.1	22.3	21.7	20.1	19 to 21
Net cash farm income to debt ratio 12/	39.0	46.3	47.4	42.2	45.8	39 to 43
Ratio						
Financial leverage index 13/	0.72	0.79	0.80	0.74	0.81	.7 to .8

F = forecast. 1/ Assesses the ability of farm businesses to repay both principal and interest. 2/ Indicates the proportion of gross cash farm income needed to service debt. 3/ Shows the farm sector's ability to service debt out of net income. 4/ Shows the proportion of all assets that are financed with debt. 5/ Measures the relative proportion of funds provided by creditors (debt) and owners (equity). 6/ Measures the ability of farm sector management to realize an adequate return on the capital invested by the owner(s). 7/ Measures how efficiently managers use farm assets. 8/ The profit margin indicates profits earned per dollar of gross income. 9/ Gives the portion of gross cash farm income absorbed by production expenses (claims on farm businesses). 10/ Gives the proportion of gross cash farm income committed to interest payments. 11/ Measures the gross farm income generated per dollar of farm business assets. 12/ Indicates the burden placed on net cash farm income to retire outstanding debt. 13/ Indicates whether the use of financial leverage is beneficial.

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